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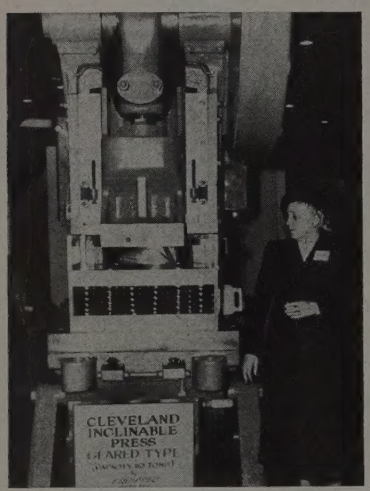
Behind the Scenes...

Results of the Poll

If you were one of the thousands who voted on our voting machines at the Metal Show in Philadelphia, you will probably be interested in the answers to some of the things we asked. Preliminary figures were in the editorial section last week, because we were extremely generous and allowed the editors to scoop us on that one. Here are the finals: For president, in percentages of total votes cast, Dewey 71.7%; Truman 21.3%; Wallace, 3.2%; Thurmond 1.7%; all others, 2.1%. The Metal Show goers were just about evenly divided on the new f.o.b. mill prices, with 51.7% against them and 48.3% in favor of the new system. The steel shortage was quite evident, because 73.3% of the voters said their plants had production difficulties because of the lack of sufficient steel.

Meet Mrs. President

One of the busiest "men" at the show was the president of Cleveland Punch & Shear Works Co. — Mrs. Florence M. Sayle, whose picture was shot alongside one of her plant's



products by our ace cameraman, Dan Reebel. This was Mrs. Sayle's first experience as a Metal Show exhibitor, and from what we could see, she was operating like an old hand at the game.

Cupid vs Steel

One of the incidents of the show involved a starry-eyed little gal who came into our booth looking for help. She cornered Cal Fisher, our New England circulation expert, and in tearful tones asked him if we might help her find some steel. Seems that her fiance operates a metal fabricating plant, and because of the steel shortage, he wasn't able to make enough money to get married. She knew that if she could just get him a little more steel, they'd be able to set a date. Cal explained that we didn't have any loose steel around, but he gave her a list of people to see at the show, and he vows that if she saw all those people and turned on the charm for them, there will be another happy couple in the world —and soon!

Coincidence in Korea

At the beginning of the show, one of our boys picked up a strange letter, written in hieroglyphics which might have been Chinese or Japanese. We kept it as a curiosity, and a couple of days later a gentleman who was obviously an Oriental came wandering by the booth, stopped in to look at the voting machines and ask a few questions. We suddenly thought of the letter, brought it out, and asked the man, whose name was Lee, if it made any sense to him. Mr. Lee took the letter, and a peculiar expression came over his face as he read it. He told us that the letter was written by a very good friend of his from Korea, a man who had been in Philadelphia two weeks previously, and who in fact had spent two days at Mr. Lee's house. There were a good many thousand people at the Metal Show, and how we managed to single him out is a question we'll never be able to answer.

All Was Dewey

While we were operating the poll, we had a number of interested people come in to take a look at the current standings. One gentleman was particularly anxious to get the figures, because he said they certainly had an important effect on his future. In fact, he told us he might have to move after the election. We stole a quick look at his badge and discovered that his name was T. Dewey! Didn't have a mustache, though, so it couldn't have been the No. 1 T. Dewey in disguise. We were extremely Dewey-conscious throughout the show, however, because our hotel room was the now-famous 807 at the Bellevue, which was Dewey's room during the convention.

Shrdlu

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STEEL

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NEXT WEEK . . .

New Applications Found for Aluminum Extrusions

How to Sharpen Carbide-Tipped Hobs

High Frequency Induction Surface Hardening

Advantages of Bessemer Steel In Producing Tubular Products

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 123, NO. 19 NOVEMBER 8, 1948

NEWS

TECHNICAL

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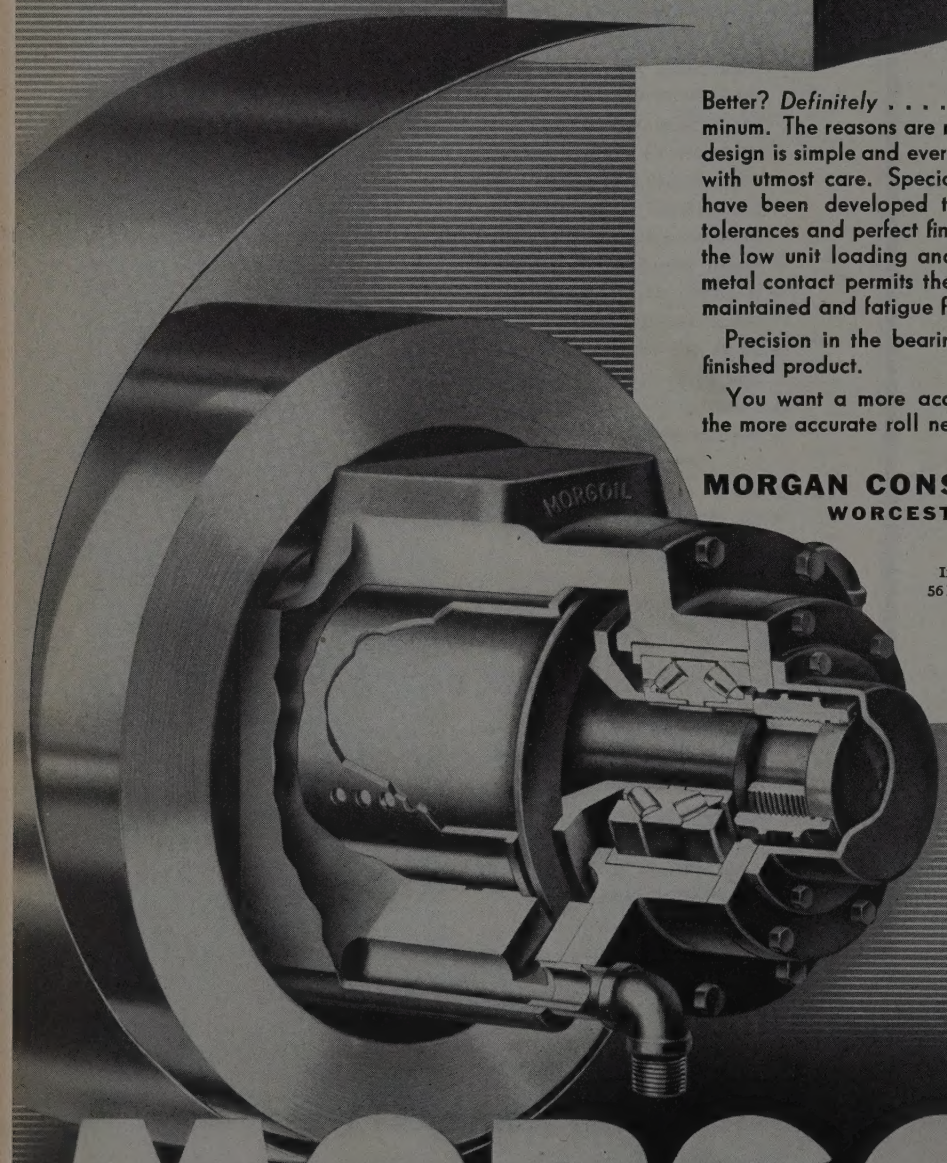

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ROLL NECK BEARINGS

November 8, 1948

A Job To Be Done

While faithless Democrats, over-confident Republicans, misguided Progressives, professional pollsters, gullible editors and political experts of newspapers, cocksure columnists, know-it-all publishers of confidential Washington "tip" sheets and too-erudite radio commentators who profess to know the innermost thoughts of the American people are attempting to explain why they were 100 per cent wrong in predicting the outcome of last Tuesday's election, it behooves American industrialists to consider seriously where they stand in relation to that surprising event.

They stand in a discredited position. A majority of industry's executive, operating and technical personnel is believed to favor Republican doctrines. Numerous top-flight industrialists openly avow their Republicanism and are active in G.O.P. affairs. The public feels that industry and the party are closely related. Therefore, thousands of Republicans in industry should share responsibility for the continued and consistent failure of Republicanism over a period of nearly two decades and should do something about it.

One thing that industry can do about it immediately is to start a planned effort to make a favorable attitude toward industry on the part of a candidate for the presidency of the United States a political asset instead of the political liability that it is.

This will require a complete overhauling of industry's concept of public relations. For years industry has been pouring hundreds of millions of dollars down a rat hole in a belief that if the man in the street can understand industry properly, he will support it staunchly. The cold truth is that the average citizen has more faith in industry and in the free enterprise system than he has in the ability of some of industry's leaders to administer the system properly.

We suggest that part of the effort made in the past to "sell" industry to the public henceforth be devoted to directing industry's affairs so that the average man actually receives his proper share of industry's benefits in a form that he can easily recognize. When that has been accomplished there will be no need to "sell" him anything.

Secondly, we suggest that those members of the Old Guard whose presence in the high councils of Republicanism has been of doubtful value, abdicate in favor of younger men with open minds.

* * *

NEW ORDEALS LIKELY: With President Truman in the White House in his own right and not as the successor of a President who had died in office, and with members of his own party holding comfortable majorities in both houses of Congress, American industrialists can expect to witness some rather sharp changes in government policies affecting their business.

It is almost certain that President Truman will renew his demands upon Congress for standby authority to impose more government regulations upon industrial operations. Depending upon the circumstances prevailing when Congress convenes, this may mean a return to some form of limited price control and to an extension of the voluntary allocation of certain scarce materials, or to mandatory allocations or even outright rationing.

Labor's voice in government affairs will be stronger than ever before. Labor's representatives will be in a strategic position to demand the President's support for fourth round wage increases and drastic modifications, if not repeal, of the Taft-Hartley Law.

Also, the chairmanships of important congressional committees—including, for instance,

(OVER)

the Capehart committee on pricing systems—will shift to men who are less favorably inclined toward business than are the incumbents. All along the line, in virtually every contact between government and business, industrial executives will find themselves dealing with government representatives whose decisions will be influenced to a considerable extent by the vote of confidence which the American people last Tuesday gave to the general objectives of the reborn New Deal. —p. 61

* * *

OUR STOCK IN TRADE: Many persons from abroad have the idea that everything in the United States is produced or manufactured in tremendous quantities. They assume that our ability to make long runs on identical parts is a major factor in our economy.

So-called "mass production" is important in our system. Nevertheless, A. G. Bryant, retiring president of the National Machine Tool Builders' Association, is right when he says that a majority of American manufacturers are engaged in producing items that are not needed in large quantities. "The genius of America," he declares, "lies not so much in the theory of mass production as in the principle of interchangeability of parts, which is applied to small lot as well as mass production."

Ability to work to close tolerances—the basis of interchangeability—gives us a flexible technique that is adaptable to work of any volume. —p. 95

* * *

WORK OF MANY SKILLS: In connection with the "Salute to Alloy Steels" at the 30th National Metal Congress, distinguished service awards were presented to 75 individuals for outstanding contributions to the progress and development of alloy steels. A perusal of the names of the persons thus honored shows that while metallurgists and others who participated in the technical development of alloy steels are in the majority, the list includes many individuals whose contributions were in the fields of promotion, sales, education and literature.

This is as it should be. Progress in alloy steels has been due to the work of men of many skills. Executives with vision and courage had to authorize appropriations for research and development, technicians had to perfect the alloys, engineers had to help adapt them to commercial use, market research men and salesmen had to merchandise them and professors and writers had to disseminate knowledge of the techniques of alloy steel.

All members of the team deserve the honor bestowed upon them. —p. 104

* * *

HINT 2000-TON STACK: Only 20 years ago, speakers at a meeting of blast furnace engineers and operators discussed the possibility of a 1000-ton stack. Shortly thereafter units of this size became a reality and most of the ideas projected at that meeting have been reflected in every new furnace built since.

At the meeting of the Blast Furnace & Coke Association of the Chicago District and the Eastern States Blast Furnace & Coke Oven Association on Oct. 29, speakers suggested that tomorrow's pig iron may be smelted in a stack of 2000 tons per day rated capacity. The ideas regarding the design and operation of the 2000-ton stack voiced at this meeting certainly are no more fantastic than were the predictions of the 1000-ton unit two decades ago. With present day furnaces occasionally producing 1800 or 1900 tons in a single day, the advent of a 2000-ton rated furnace should not be far off. —p. 62

* * *

NATIONALIZING STEEL?: A bill introduced in Parliament would form the "Iron & Steel Corp. of Great Britain" which, on May 1, 1950 or 18 months after passage of the bill, would take over the securities of 107 major British companies engaged in producing iron ore, pig iron, steel ingots, rolled steel and allied products.

Thus 97.5 per cent of the iron ore capacity, 97.6 per cent of that of pig iron, 99.6 per cent of that of steel ingots and varying percentages of the capacities of other products would be taken into the government corporation. Of companies not taken over, those producing up to 50,000 tons of ore or 20,000 tons of basic steel products annually would need government licenses to operate. Companies producing less than 5000 tons a year would continue without license.

Public reaction to this controversial proposal may well determine the future of the Labor government. —p. 72

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

POLITICAL UPSET— Business leaders last week were making a hasty reappraisal of things to come (p. 61) as result of the surprise Democratic victory. More controls, a greater labor voice in government, higher level of spending, public power expansion and possibly government invasion of industry, and a continuation of the socialistic trends of the New Deal loom ahead. Gag of the week: "What was that loud noise?" "Just another election forecaster shooting himself."

WHITHER BUSINESS?—Do the soft spots appearing here and there in business presage an end of the boom? Opinion varies, but the majority holds that although the postwar peak may have been passed volume will continue good through this year and may react with an upsurge (p. 73). Meanwhile, auto replacement parts manufacturers find business tapering (p. 75) while tool and die shops say orders are falling off. The coal producers are beginning to suffer from overproduction. Steel output, however, continues at a peacetime high (p. 153), blast furnaces are being operated at the highest rate in four years (p. 62), and a Midwest metalworking executive sees inflationary forces pushing prices still higher (p. 66).

LARGER STACKS— Tomorrow's pig iron may be produced in stacks of 2000 tons daily capacity, blast furnacemen agree (p. 62). The 2000-ton furnace, they say, is no more fantastic than 1000-ton furnaces were considered 20 years ago.

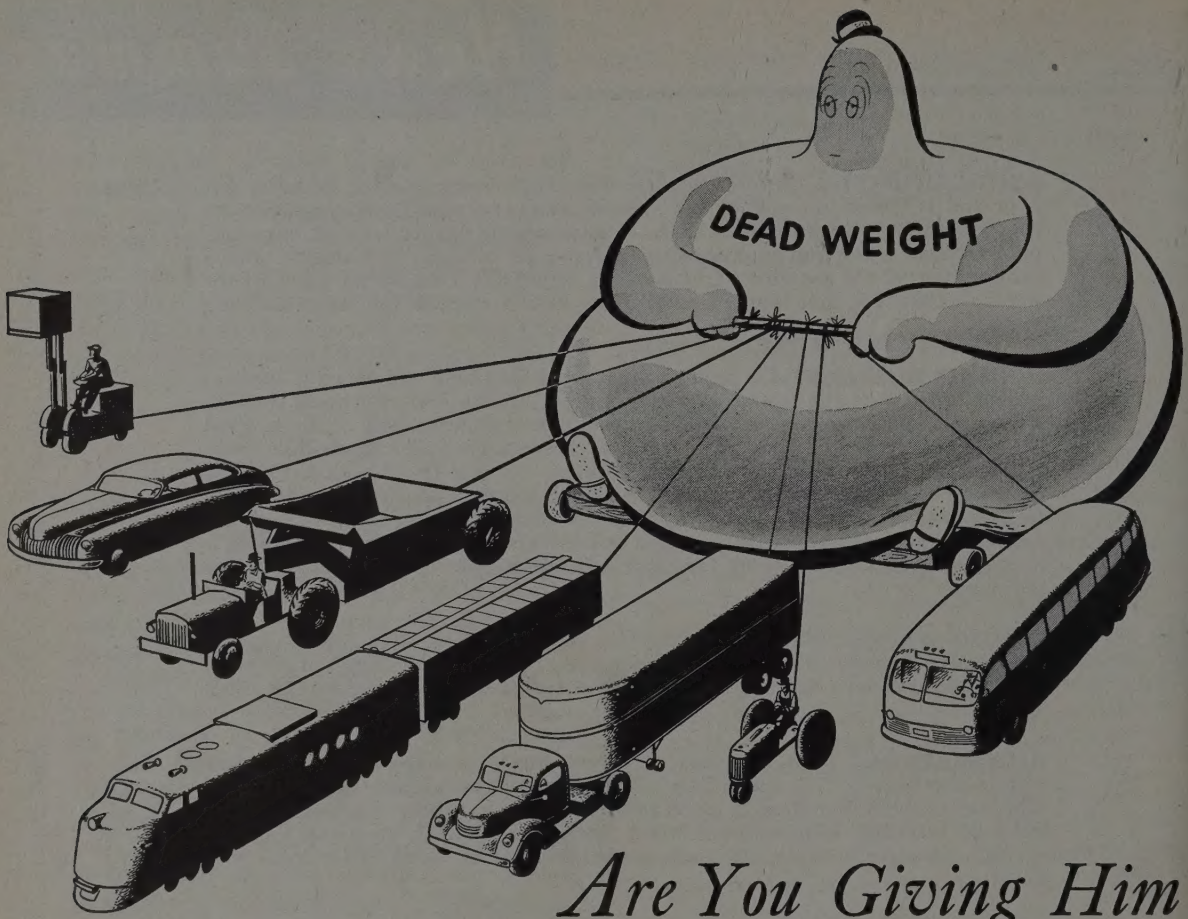
AUTOMATION— Ford engineers are developing a new technique in pressed metal operations (p. 75) which they call "automation." It centers around automatic mechanical handling of parts between press operations and such further steps as assembly, welding, etc. Many devices required in the setup must be specially designed. Some 500 such mechanisms are included in the Ford system.

WEST COAST—When steelmaking and finishing projects now underway are completed, the West Coast will have made important steps toward self-sufficiency in the matter of steel supply (p. 64). By 1950, output of finished and semifinished steel in that area should exceed 3 million tons yearly, more than triple the 900,000 tons being produced a decade ago. However, current demand is running around 5 million tons and still is expanding.

NATIONALIZATION—Britain has moved one step further down the road toward nationalization of her steel industry (p. 72). A nationalization bill has been introduced by the Labor government which holds a two-to-one majority in the House of Commons, but passage is by no means certain. Conservatives are prepared to make a last ditch fight against the measure and will point to the shortcomings of Britain's experiments with the railroads and the coal industry, which have been expensive.

MECHANICAL MOLE— A continuous mining machine, capable of digging and loading soft coal at a rate of 3 tons or more a minute, is attracting much interest in coal circles (p. 63). Its developers claim the contraption can raise output to 100 tons per man-day, compared to the present average of 5 to 6 tons, and may lower costs substantially enough to accelerate production of synthetic oils and gasoline from coal.

HERE AND THERE IN INDUSTRY— Steel export quotas for fourth quarter have been reduced 60,000 tons from the previous period (p.73) . . . Mahoning Valley Steel Co. will increase its hot-rolled sheet capacity by more than 20 per cent (p. 78) . . . Mullins Mfg. Corp. is expanding (p. 78) at Salem and Warren, O. . . . Release of findings of the 1947 Census of Manufactures is starting (p. 70). . . . . The Supreme Court's decision in the "overtime-on-overtime" case is not proving the threat to industry generally that was predicted earlier (p. 68). . . . . Plate fabricators are asking that mills devote more capacity to plate production to offset the substantial tonnages being allocated (p. 64) . . . . . Steel buyers continue to ponder the effect of mill pricing on their positions (p. 65).



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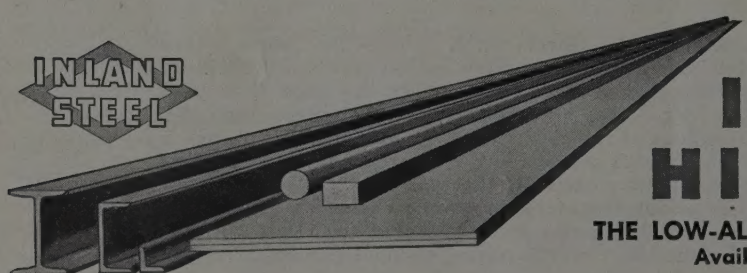

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Four More Years with Truman

Hand of government to lay more heavily on business and industry as President gains majority in Congress. More controls, higher spending probable

MORE controls, a stronger labor voice in government, public power program expansion, high-level support of farm prices and wages, a paternalistic housing program and continued free spending.

These are some of the things that may be expected from Washington during the next four years as result of the surprising victory of President Truman and the Democratic party in Congress.

Continuation of the socialistic tendencies of the New Deal era is believed almost certain. Mr. Truman is pledged to extension of social security, increased minimum wages, national health insurance and federal aid to education.

Controls—Twice in the past 12 months, the President presented to the 80th Congress a program of controls to combat inflation. Twice it was given the brush off by the Republican-dominated Congress. Now with clear majorities in both houses, Mr. Truman should have little difficulty in gaining approval for his anti-inflation program.

The proposed controls include: Authority to ration materials and products in short supply; allocation and inventory control of scarce commodities which affect essential industrial production or the cost of living; excess profits tax to provide a treasury surplus and a brake on inflation; price control of scarce commodities and authority to limit wage advances which would force a break in price ceilings.

Taft-Hartley Act—Repeal of this law was a plank in the Democratic platform, was advocated consistently by the President during the campaign and was immediately demanded by union leaders after Mr. Truman's election. Taft-Hartley repeal will be one of the first issues put up to the new Congress.

Whether or not the administration can swing outright repeal is questionable. A majority of the Democratic members of the 80th Congress voted to override the President's veto of the act. A coalition of southern Democrats and Republicans in the new Congress might block repeal.

However, more than 50 congressmen who voted for the Taft-Hartley bill were defeated in last week's election, often by pro-labor candidates.

The Senate Labor Committee will be headed either by Senator Murray of Montana or Senator Thomas of Utah, both of whom are opposed to the Taft-Hartley Act. The House Labor Committee probably will be headed by Representative Lesinski of Michigan, also a labor disciple.

The changes in congressional membership and in labor committee leadership and the consciousness of labor's role in the recent election will tend to make any changes in the act favorable to labor, even if the repeal move fails.

Taxes—The administration fought the tax reductions passed by the Republican-controlled 80th Congress.

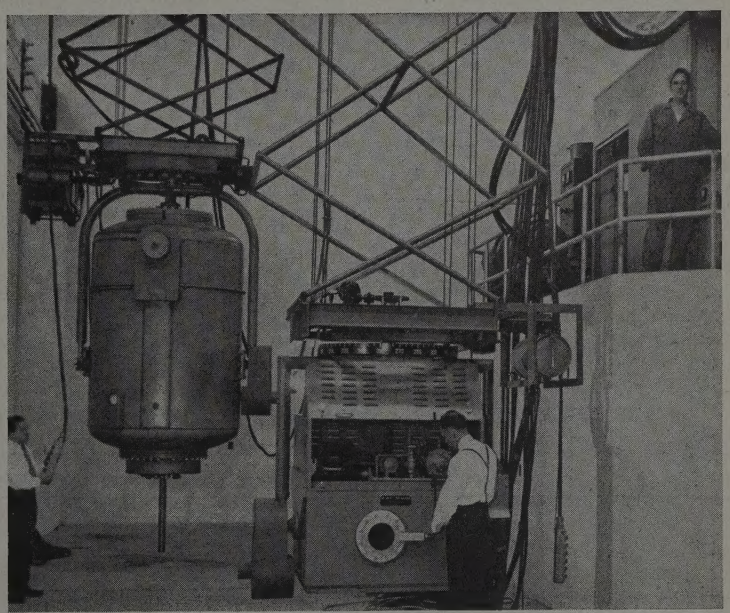
Programs now underway or projected by the Truman administration presage a sizable increase in federal spending. The new budget is expected to run over $45 billion, and may go much higher. Foreign aid, rearmament, military lend-lease to rearm western Europe, reclamation and power projects will contribute to the increase in federal expenditures.

The next change in taxes will be upward.

Government in Industry—High on the agenda of the Truman program will be expansion of the public power program, spearheaded by quick authorization of the new Johnsonville steam plant as an adjunct to the Tennessee Valley Authority.

Later, government participation in industrial expansion may be considered. Labor leaders and members of Mr. Truman's administration long have advocated expansion of steel capacity with the aid of government financing.

A government housing program in which taxpayers will absorb a considerable part of the cost of housing low-income families is considered almost certain of adoption.



PENETRATING: A 10-million-volt x-ray generator, whose rays are capable of penetrating 16 inches of steel, is being installed at the Naval Ordnance Laboratory, White Oak, Md. Equipment must be housed in a specially reinforced building for personnel protection. Built by GE, the machine will go into operation after the first of the year and will be used to study internal assemblies of mines and other ordnance items

Discuss 2000-ton Blast Furnace

Smelting of tomorrow's iron in huge daily capacity stacks seen possible in near future due to progress in furnace design and engineering

BLAST furnace design and engineering have progressed to the point where tomorrow's iron may be smelted in a stack of 2000 tons per day rated capacity.

A portent of what is to come in this direction was revealed in a panel discussion in Chicago, Oct. 29, when the Blast Furnace & Coke Association of the Chicago District and the Eastern States Blast Furnace & Coke Oven Association convened in joint meeting at the Del Prado Hotel.

In remarks prefacing the discussion on the 2000-ton blast furnace, Harry A. Strain, director of raw materials, fuel and power, Carnegie-Illinois Steel Corp., Pittsburgh, pointed out that it was only two decades ago that a 1000-ton furnace was put before the two associations, and that the ideas projected at that time have been reflected in every new furnace built since. Consequently, Mr. Strain asserted, a 2000-ton unit is no more fantastic today than a 1000-ton furnace was regarded 20 years ago.

The panel discussion was divided into three parts, with Samuel Naismith, ore evaluation engineer, Oliver Iron Mining Co., Duluth, dealing with "Ore Preparation for the 2000-ton Furnace;" E. J. Gardner, superintendent, coke plant and blast furnaces, Inland Steel Co., Indiana Harbor, Ind., covering "Coal Preparation;" and William S. Unger, blast furnace engineer, Carnegie-Illinois Steel Corp., Pittsburgh, informally discussing "Furnace and Auxiliary Design."

Beneficiated Ores Better—Mr. Naismith dealt with the part which improvement in raw materials plays in increasing blast furnace capacity. In its essentials, the 2000-ton stack is similar to the present 28-ft hearth furnace. Tests conducted on two furnaces through use of natural and beneficiated ores show the latter ores gave higher production and the charge required less space per ton of iron.

After reviewing present-day research and beneficiation of ore, including sintering, pelletizing, nodulizing and briquetting, Mr. Naismith enumerated considerations for the 2000-ton furnace as follows: 1. Fractionation of coarse and fine ores; 2. permeability of ore charge; 3. bulk of the charge; 4. reducibility of the ore; and 5. uniformity of chemical and physical properties of beneficiated materials.

Commenting on Mr. Naismith's presentation, Mr. Strain emphasized that the art of making iron has reached the point where design of the blast furnace and arithmetic can be worked together.

Step by Step—In arriving at the size and lines of a blast furnace to produce 2000 tons per day, Mr. Unger started with the stoves and moved step by step through the various auxiliaries. Using the rule of thumb of 5000 sq ft of heating surface per ton of iron in a stove, a 2000-ton stack would require 1 million square feet, or three stoves with one-third million square feet each.

Checkerwork in the stove must withstand crushing from its own weight, a consideration which places limitations on stove height. In Mr. Unger's judgment, solution of the problem lies in a stove diameter somewhat increased over present practice and height not to exceed 110 feet.

As to blowers, Mr. Unger said the 2000-ton furnace will require enough air to burn 1700 pounds of coke per ton of iron. Best judgment suggests installing blowers capable of delivering 125,000 cu ft of air per minute.

Gas cleaning can be accomplished to best advantage by provision of two tower washers in parallel with a pump providing 5000 gallons of water per minute. Two precipitators should be installed.

Coke bins should be constructed parallel to the ore bins, with a vibrator discharge to a belt.

Computations indicate that a blast furnace of 2000 tons capacity would require a volume of 50,900 cu ft. Selecting 8-1/3 hours as retention time of a charge, a hearth diameter of 30 ft is arrived at, working height of the stack at about 86 ft and overall height of approximately 116 ft.

Blast Furnace Rate Rises

ALTHOUGH blast furnaces are being operated at the highest rate in four years, pig iron production is still inadequate to meet demands fully.

Some improvement in supplies has been noted recently as a result of heavy domestic production and large importations of foreign iron. The supply position of merchant iron users has been particularly tight because steelmaking operations have been maintained close to capacity for many weeks, requiring an unusually large tonnage of hot metal.

Blast furnace operations increased to 94.3 per cent of capacity in September, the highest rate recorded since April, 1944, when it was 95.5 per cent. The rate for the first nine months was 87.8 per cent compared with 89.1 per cent for the like 1947 period, according to the American Iron & Steel Institute.

Cut in September—Production of pig iron, ferromanganese and spiegeleisen declined in September, however, due to the shorter month, to

PIG IRON AND FERROALLOY PRODUCTION FOR SEPTEMBER AND YEAR TO DATE

Blast Furnace Capacity and Production—Net Tons — SEPTEMBER - 1948

	Number of companies	Annual blast furnace capacity	Production: Pig Iron — Current month	Pig Iron — Year to date	Ferro manganese and spiegel — Current Month	Ferro manganese and spiegel — Year to date	Total — Current month	Total — Year to date	Percent of capacity — Current month	Percent of capacity — Year to date
DISTRIBUTION BY DISTRICTS:										
Eastern	11	13,093,560	1,008,804	8,172,643	25,474	255,173	1,034,278	8,427,816	96.5	86.0
Pittsburgh-Youngstown	17	25,588,120	1,997,301	17,189,130	12,785	175,742	2,010,086	17,364,872	96.0	90.6
Cleveland-Detroit	6	6,495,000	532,433	4,431,778	-	-	532,433	4,431,778	100.1	91.1
Chicago	7	14,700,290	1,075,099	9,084,806	-	10,190	1,075,099	9,094,996	89.3	82.6
Southern	8	4,949,660	382,037	x 3,298,283	5,066	66,034	387,103	x 3,364,317	95.5	90.8
Western	3	2,612,300	168,534	1,648,439	-	-	168,534	1,648,439	78.8	84.3
TOTAL	35	67,438,930	5,164,208	x43,825,079	43,325	507,139	5,207,533	x 44,332,218	94.3	87.8

x Adjusted.

5,207,533 tons from 5,254,612 tons in August, making the total for the first nine months 44,332,218 tons against 43,787,594 tons for the like 1947 period.

Production of pig iron, totaling 5,164,208 tons in September, was distributed as follows: Pittsburgh-Youngstown, 1,997,301 tons; Chicago, 1,075,099 tons; eastern district, 1,008,804 tons; Cleveland-Detroit, 532,433 tons; southern, 382,037 tons; western, 168,534 tons. Ferromanganese and spiegeleisen output totaled 43,325 tons in September, making the first nine months output 507,139 tons.

Total steel output, amounting to 7,415,610 tons for September and 64,987,520 tons for the first nine months, included 699,444 tons and 6,216,744 tons of alloy steel, respectively.

Stack's Iron Capacity Upped

TO INCREASE efficiency of its No. 2 blast furnace at Buffalo, Republic Steel Corp., Cleveland, has converted that stack to "high top pressure" operation. The furnace is one of the company's two there supplying iron for steelmaking. No foundry iron is produced at the Buffalo plant.

The company expects the change in technique to increase the furnace's 900-ton daily capacity to 1080 tons. Republic is using pressure blowing technique in blast furnaces at Cleveland, Chicago, Youngstown and Warren also. Republic's experience shows that output of furnaces using this technique can be increased by 20 per cent or more if sufficient blowing capacity is present.

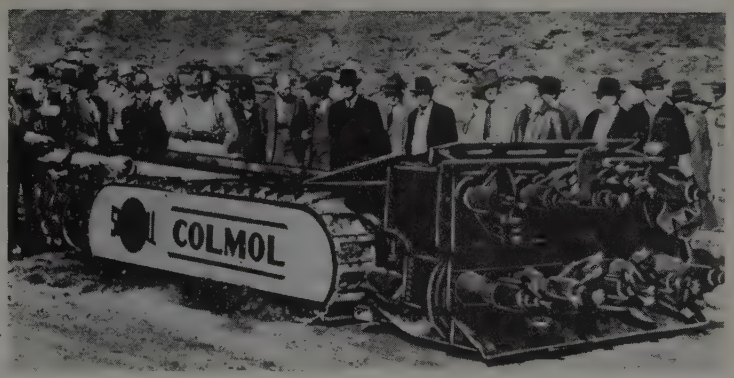
Foundries Press for Pig Iron

DECLINE in foundries' order backlogs has not reduced the demand for merchant pig iron and won't until it is possible to return to normal ratios of iron and scrap in melts.

With ratio of iron in melts much lower than normal because of an insufficiency of the material, and with iron $25 to $30 a ton cheaper than foundry cast scrap, foundries will be inclined to accept all the iron available until the percentage of iron in their melts reaches the highest advisable maximum.

Until there is a decline in demand for steel, there will be no increase in the amount of merchant iron available. However, a 10 per cent reduction in steelmaking operations would begin to make some blast furnaces available for merchant iron production, a leading producer of merchant iron asserted.

Shortage of railroad gondola cars is hampering shipment of merchant pig, some producers having to pile iron on the ground until cars arrive for loading.



Mechanical Mole Speeds Coal Mining

A CONTINUOUS mining machine which digs and loads soft coal at a rate of 3 tons or more a minute may revolutionize the coal mining industry.

The contraption, known as the "Colmol" and resembling a huge mechanical mole, was developed by Sunnyhill Coal Co., Pittsburgh, and recently was demonstrated to the press at the company's New Lexington, O., mine.

Sunnyhill claims the Colmol can produce 100 tons a day for every man employed. The average American miner today produces about 5 tons a day. In the most modern underground mines, using the latest cutting, drilling and loading machinery, output may reach 15 to 20 tons per man-day. Strip mines with large shovels and draglines may produce as much as 30 tons per man-day.

Potentially, the new mining machine may reduce coal production costs sharply by requiring fewer miners. Substantial reductions in coal costs may bring plans for producing synthetic oils and gasoline from coal to an earlier fruition.

The Colmol is a low-slung tractor with 10 rotating cutting heads attached to its front. These cutting heads chip the coal from the mine face as the machine advances under its own traction power. Loose coal is carried to the rear of the machine and thence by conveyors to cars or trucks. It thus consolidates in one operation the four separate operations in conventional mining: (1) Undercutting the seam; (2) drilling; (3) blasting; and (4) loading.

The machine itself weighs 26 tons, is about 25 ft long. It is capable of making continuous cuts 9½ ft wide, 4 ft high at a rate of 18 to 36 in. a minute.

Only four men are required for operation at the face, an operator, a foreman and two timbermen. One machine may produce 500 to 1000 tons of coal per shift.

Several other companies have been working on continuous coal mining machines. Joy Mfg. Co., Pittsburgh, came out with a continuous miner last year and has been making trial runs in Pennsylvania mines. Jeffrey Mfg. Co., Columbus, O., Goodman Mfg. Co., Chicago, and the H. C. Frick Coke Co. are reported to have continuous mining devices in development.

More Steel for Converters

CONVERTERS and processors received substantially more steel in July than in the preceding month, although total shipments from mills decreased.

A report just issued by the American Iron & Steel Institute, New York, shows converters and processors were provided a net total of 303,369 net tons in July, compared with 263,535 tons in June. Total steel shipped from mills in July is reported as 5,229,880 tons, a decrease from June's 5,476,774 tons.

Also receiving increased tonnages in July as compared with June were the oil and gas drilling industry, container makers, and ordnance and military. However, the latter's receipts were only 3168 tons in July, compared with 2374 in June.

The automotive industry continued in July to be the largest consumer.

West Moves Toward Steel Self-Sufficiency

Capacity more than tripled in decade. New projects to provide variety of products with emphasis on light flat-rolled. Current needs are 5 million tons

LONG strides toward making the West Coast more self-sufficient in meeting its demands for steel will be taken over the next two years. New production facilities just getting underway or due to be completed by 1950 will raise western output of finished and semifinished steel products to well in excess of 3 million tons annually.

Geneva Steel Co., U. S. Steel's Utah subsidiary, expects to make 1,010,000 tons of steel products in 1949. A decade ago all West Coast steel plants were producing at a rate of only 900,000 tons annually.

Need 5 Million Tons — Currently, western metalworking plants could use about 5 million tons a year. They are receiving about 4 million tons, of which about 2.7 million tons are produced in the West.

Obviously, should demand continue at the present rate, the West will have to draw substantial tonnages of steel from the East even after projected expansions are completed. Should demand level off, however, the more than 3 million tons of capacity will go a long way toward closing the present gap between supply and demand.

New Mills—A major step toward raising the supply of "home-made" steel is the opening of Columbia Steel Co.'s new cold-reduction sheet and tin plate mill at Pittsburg, Calif. This plant is rated at 325,000 tons, may produce 350,000 tons. It will draw its raw material from Geneva in the form of hot-rolled coils.

In 1950, Columbia hopes to bring a new sheet mill, with capacity of 325,000 tons, into production at Torrance, Calif.

In addition to the U. S. Steel expansion, Henry J. Kaiser is building a new blast furnace and is expanding other facilities at Fontana. Included in the new projects is a pipe mill.

Bethlehem Steel also is expanding its West Coast facilties.

Freight Important—Transportation charges are tremendously important to West Coast steel mills and to steel consuming plants. Several competitors of Geneva Steel recently petitioned the Interstate Commerce Commission to increase freight rates from Geneva to the West Coast from $11.60 to $16.80 a ton. Kaiser, Colorado Fuel & Iron and Sheffield Steel Corp. contended the $11.60 rate was discriminatory and created an unfair competitive advantage.

Consumer interest stanchly defended the lower rate. Dr. J. R. Mahoney, director of business research, University of Utah, testified that the future of the Geneva plant depends on large volume production and contended the increase in freight rates would cut the plant's business to a point where it could produce only pig iron.

Railroads serving Geneva have agreed to the lower rate.

Production Allocation

Fabricators urge mills increase output of plate and other scarce items in proportion to demand

ALLOCATION of production in steel mills is being advocated by the Steel Plate Fabricators Association, Chicago.

Production allocation, the association holds, is just as important, if not more so, than allocation of distribution.

In an effort to achieve production allocation, the association, which represents the major portion of the plate fabricating industry in the United States, has suggested to Secretary of Commerce Charles Sawyer, Earl W. Clark, director of Office of Industry Co-operation, and M. W. Cole, OIC's iron and steel adviser, that the OIC attempt to persuade steel mills to increase production of steel plate and other items in heavy demand in proportion to their needs within the security program.

Mr. Cole is circulating the suggestion to members of the Steel Products Advisory Committee. Commerce Department comments that it has authority only to enter into voluntary agreements to allocate from tonnage of products actually produced and that it has no power to order steel companies what to produce.

Cites Allocation Law—In a letter to Mr. Cole, the association's secretary, J. Dwight Evans, said the association was of the opinion that the purpose of Public Law 395 was to assist in providing as well as distributing critical materials such as steel for the restoration of the nation's peacetime economy and re-establishment of the national security with the least amount of inconvenience to normal production and distribution on an equitable basis.

"As large quantities of plate are necessary to support the various security programs, which rightfully have been given top priority under present allocations, it is obvious," said the association, "that in the best interest of the nation, sufficient quantity of plate should be produced to provide for security purposes and an equitable amount left for normal demands.

"To keep an even balance within our industrial economy, we also feel that the unallocated portion of the steel mills' capacity should be kept in a normal product mix and left to a free but legitimate market. By such a program all users of steel

CUSTOMER INSPECTION: This Convair-liner is shown in the new customer-CAA inspection station at Consolidated Vultee's San Diego, Calif., plant. Here buyers or CAA officials make their inspection of the craft; if changes are requested, they are made here. Convair is producing four such liners weekly

would be penalized to some extent but all would share in a more equitable distribution of the remaining supply of free market steel," the association declared.

The association's members fabricate more or less custom-built items for many different industries such as petroleum, chemical, food, textile, steel mills, blast furnaces and utilities.

East's Steel Sources Shrink

Baltimore district buyers view with concern their narrowing supply sources

SINCE shift to mill pricing in the steel industry, Baltimore district buyers have been viewing with increasing concern a narrowing in their sources of supply. Prior to the pricing change, various inland producers had been withdrawing from eastern seaboard markets, and since the change this trend has been accelerated.

District consumers are fortunate in having large steelmaking facilities at hand, notably at Sparrows Point. Nevertheless, not all products are produced in the district, nor is there the capacity on those that are produced to meet the full needs of buyers falling within the competitive range of local mills.

Not Like Pittsburgh—Baltimore is not like Pittsburgh where steel production not only exceeds local consumption but is more diversified. It is perhaps in recognition of this fact that since the change in pricing relatively few inquiries have developed from outside metalworking firms with respect to establishing plants in Baltimore.

In a district the size of the Baltimore metropolitan area, with its highly diversified industries, excellent rail and port facilities and its generally stable labor market, there is always certain current interest in new industries, and this interest over the years has led to the location in the area of various new companies. Included have been a number of new metalworking plants which use mainly the types of steel products produced at Sparrows Point. Production of stainless and other alloy products in the district also have provided drawing power.

Buyers Disturbed — Nevertheless, most local buyers are disturbed over the tendency of inland steel producers to concentrate on markets nearer home. At the moment readjustments in pipe distribution are especially noticeable with some mills withdrawing entirely from the market, severing distributor connections of many years' standing. Meanwhile, the local producer is taking on new accounts in a selective fashion, while withdrawing from distant markets.

Recently a large Pittsburgh producer pulled out of the Baltimore market on nails and there are other similar developments, either consummated or in the making, all of which is keeping things churned up, with many buyers not knowing where they stand. Not all distant mills have withdrawn completely from the market, nor do they indicate an intention of planning to do so. Moreover, various eastern producers outside the immediate Baltimore area can be relied upon to serve consumers in the district at least to a limited degree for certain items.

Many Baltimore steel buyers, while concerned over the immediate outlook, are less pessimistic over long term prospects. As time passes they feel the situation will iron itself out. Eventual return to more competitive conditions in the sale of steel, they think, will have a salutary effect, and that possible legislation may later lead to return of more traditional pricing in steel, in part at least.

Midwest Steel Buyers Alarmed

HOW strongly most Midwest steel users feel about abandonment of basing point pricing is indicated by their vehemence when discussing the changeover.

There's been time enough since advent of f.o.b. pricing for some of the effects to be felt, and meetings to summarize steel consumers' position since the change are being held with greater frequency.

One such meeting, in Topeka, Kans., heard Payne Ratner, former governor, predict that gains made in the last 10 years in Kansas and neighboring states toward industrialization may be erased by movement of fabricators to Chicago or other steel mill centers.

Legislation Needed—Outlining the way in which f.o.b. mill pricing operates to place remotely located manufacturers and steel fabricators at a disadvantage with competitors near steel producing centers, Mr. Ratner advised co-operative action on the part of Kansas and other midwestern states to obtain legislation which will restore them to "fair competitive position" with other regions.

Numerous examples were cited by some 200 manufacturers of the higher steel costs resulting from the pricing shift. A coal handling equipment manufacturer, for example, explaining how his steel comes from Chicago and Pittsburgh, reports the Pittsburgh steel is costing him about $3.20 a ton more than previously. With his principal competitors located in the East near steel sources and the largest markets, his competitive position is endangered.

Problems Intensified—Affected to lesser extent than Kansans are consumers in and around Chicago, but since producing capacity of the area is substantially less than consumption, the new freight burden imposed on steel brought in from other centers is upping manufacturing costs.

Sees Pittsburgh Threatened

THE NEW f. o. b. mill pricing system ultimately will harm—not help—Pittsburgh, in the opinion of the National Affairs Committee of the Pittsburgh Chamber of Commerce, Chairman William B. McFall stated recently.

After the heavy emergency demand for steel has ended, the steel companies here will find themselves producing more steel than they can sell. This would mean curtailment in activities of some of the major steel firms, he stated. They might have to shift some of their plants elsewhere to be closer to the markets.

Heads Small Business Division

RICHARD C. COOKE, who served with the Smaller War Plants Corp. during World War II, has been appointed director of the Small Business Division of the National Security Resources Board.

The Small Business Division is one of about 30 industry divisions of the Office of Production, headed by George E. Felton.

Mr. Cooke proposed a five-point program as a guide to the divisions' activities:

1. Small business is defined as any independent manufacturing plant employing 500 or fewer persons.

2. The Small Business Division will review recommendations to be made by task groups in the other industry divisions and recommend actions designed to lead to the greatest utilization of small business facilities. The division will also recommend membership on general industry advisory committees.

3. The small business division proposes to organize a Washington committee, comprising the heads of small business sections in the various departments and committees in the federal government, and will act upon any recommendations or complaints received from these sources.

4. The division will contact the several national and sectional small business organizations, advising them of the functions of the division and

inviting specific recommendations concerning the greatest contribution that can be made by small business in the event of war.

5. The division will handle those requests received directly or indirectly from small business, and will be responsible for seeing small industry is accorded consideration and representation in planning activities.

Monetary Commission Favored

CREATION by Congress of a national monetary commission to review the entire field of currency, credit and related matters in the light of present-day problems has received the endorsement of the board of directors of the Chamber of Commerce of the United States.

The board has given general approval to the idea of a national monetary commission on the recommendation of the Committee on Economic Policy.

In its recommendation to the Chamber board, the Committee on Economic Policy stressed issues arising from a federal government debt of over $250 billion with about one-fifth coming due every year, a budget of over $40 billion per year, interest rates which are artificially controlled and incapable of performing their normal functions, and a monetary unit of fluctuating purchasing power. It held it is desirable that a fundamental re-examination of monetary and banking problems be instituted promptly.

German Patents Available

ATTORNEY General Tom C. Clark last week announced availability of nine patents, relating to the stretching and bonderizing of metals, for licensing by either the Office of Alien Property or Richard Spencer, 135 South LaSalle St., Chicago.

All licenses granted under the patents will be royalty-bearing and non-exclusive.

David L. Bazelon, assistant attorney general in charge of the Office of Alien Property, said the inventions covered by the patents were made by Dr. Fritz Singer, a German chemist and metallurgist.

The chief use of the inventions claimed by the patents cover the processes of reducing thick-walled metal tubes to thin-walled tubes. The Germans considered this process both superior to and cheaper than other methods of stretching metals and made wide use of the inventions.

Copies of the patents may be purchased only from the Commissioner of Patents, Washington 25, D. C.

Predicts Higher Prices

Speaker tells Southwest purchasers inflation spiral uncurbed; expects eventual deflation

THE ECONOMY of the nation still is being held firmly in the grip of inflationary forces which promise to push prices still higher over coming months.

That was the message given industrial purchasers of the Southwest by A. Von Wening, vice president, A. O. Smith Corp., Milwaukee. He was speaking in Dallas at the second annual purchasing conference Oct. 28-29 sponsored by District 2 of the National Association of Purchasing Agents.

Almost 400 purchasers and suppliers from such points as Dallas, Ft. Worth, Houston, Oklahoma City, Rio Grande Valley, Tampico, Mex., Texas Panhandle, Tulsa and Wichita were in attendance.

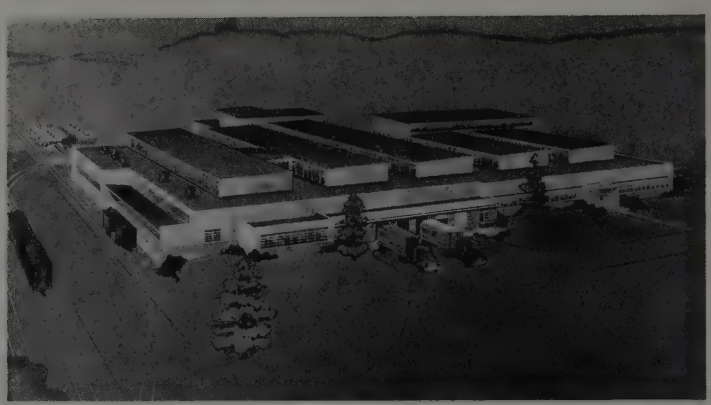
Artificial Forces—Mr. Von Wening expressed the opinion that the artificial forces which had been let loose in the economy over the past years would continue to exert an influence on prices and supplies.

Discussing the steel situation, William M. Rooney, news & market editor, STEEL, told the purchasers tight supply conditions would continue into the coming year.

Interest Sustained — Under the chairmanships of C. G. McLaren, Shell Oil Co., Tulsa, Walter Bell, Tarrant County, Tex., purchasing agent, Sam Harper, Pure Oil Co., Houston, and John Pierce, purchasing agent for the city of Wichita, a high degree of interest was maintained in the program, which moved along at a fast pace, and which covered a variety of subjects, ranging from discussions of the economic and steel situations to radio and electronic aids to industry, application of television, telephonic communication, progress in geophysics, under-sea search for oil, and the transportation of goods by air.

Speakers on the first day's program included: W. L. James, Stanolind Oil & Gas Co., Tulsa; R. Linn Crockett, American Liberty Oil Co., Dallas; D. A. Hulcy, president, Lone Star Gas Co., and president, Dallas Chamber of Commerce; Ralph Keefer, general purchasing agent, Aluminum Co. of America, and president, National Association of Purchasing Agents; Daniel E. Noble, vice president, Motorola Corp., Chicago; William M. Rooney, STEEL, Cleveland; Roy Bacus, WBAP-TV, Ft. Worth; Harding L. Lawrence, Pioneer Air Lines, Houston; Frank Witten, Southwestern Bell Telephone Co., Dallas; Eric Jonsson, Geophysical Service, Inc., Dallas; John L. Terrell, Magnolia Petroleum Co., Dallas.

Numerous Speakers—Sessions on the second day were addressed by: A.



NEW CUTTING FLUID PLANT: Several years ago, Cincinnati Milling Machine Co. researchers discovered that the key to advances in cutting fluid performance in machining steel and other metals was in controlling chemical reactions occurring at the precise point where a cutting tool begins to form a chip. As a result of this research, Cincinnati Milling found about three years ago that it was in business making Cimcool, a combination of chemicals providing both coolant and lubricant properties. Shortly after the first of the year, operations will be transferred to this completely mechanized plant at Cincinnati for mixing and blending cutting fluids and so designed that additional units can be added as demand increases

Von Wening, vice president, A. O. Smith Corp., Milwaukee; Dr. W. A. Cunningham, University of Texas; George A. Renard, executive secretary-treasurer, National Association of Purchasing Agents; William Simon, general counsel, Capehart Trade Policies Committee, Washington; Richard Downward, Texas A. & M. College; Frank John, Mid-Continent Supply Co., Ft. Worth; F. W. Littell, Shell Pipe Line Co., Houston; Fran Fendley, Humble Oil & Refining Co., Houston; F. P. Nopper, Gulf Oil Corp., Tulsa.

The banquet, presided over by Fred D. Bradley, Southern Union Gas Co., Dallas, was addressed by Clayton Rand, editor and author, Gulfport, Miss.

Scrap Supply Freer

No longer retards steel output. Consumers inventories enlarged by million tons

SCRAP supply no longer is a choke point in steel production. Steel mills are consuming purchased scrap at a rate of 30 million tons annually and inventories are adequate to assure near-term production at close to capacity levels.

Long-term outlook, however, is not so bright and should this country become involved in an emergency, the scrap shortage quickly would become acute.

This is the appraisal of the scrap supply situation given by top men of the industry at a Chicago chapter meeting.

E. C. Barringer, executive vice president of the Institute of Scrap Iron & Steel, said he believes no steel production is being lost currently for want of scrap. In addition to providing scrap for current consumption, the scrap industry has provided enough to permit consumers to increase inventories by a million tons.

German Scrap Good — Quality of German scrap to be exported to this country was reported to be "unsurpassed" by William Daniel who recently returned from Europe after studying problems attendant to shipping the scrap to this country. Mr. Daniel believed, however, that the quantity of German scrap that could be shipped to this country would be considerably lower than government estimates.

Most of the material to be shipped from Germany, Mr. Daniel said, will be No. 1 heavy melting steel. Very little cast scrap will be available.

Favors Single Corporation—Formation of a single corporation to bring the scrap out of Germany was favored by the dealers. Herman Moskowitz, president of the national institute, said that while the single agency was not the brainchild of the industry and seemed in some ways to run counter to the free enterprise system, such a corporation would be able to meet with the British buying group at the same level.

German steel scrap is unloaded at Philadelphia for shipment to Carnegie-Illinois mills at Pittsburgh. The scrap is high quality No. 1 heavy melting steel. Carnegie-Illinois will receive 40,000 tons a month under a 200,000-ton contract. NEA photo

300 Attend Distribution Forum

AN INDUSTRIAL distribution forum, sponsored jointly by the American Supply & Machinery Manufacturers' Association and National Supply & Machinery Distributors' Association, attracted 300 members to the Westchester Country Club, Rye, N. Y., Oct. 29 to discuss the theme "After the Break-Even Point, What?"

ICC Disapproves Rate Boost

INTERSTATE Commerce Commission has rejected the railroads' plea for an immediate 8 per cent increase in freight rates and will start hearings on Nov. 30 regarding the roads' request for a 13 per cent advance. At that time it will consider whether part of the increase should be made effective on short notice.

On Oct. 1 the railroads asked for an 8 per cent boost in freight rates. On Oct. 12 they raised amount of relief sought to 13 per cent and urged immediate permission to put 8 per cent of this amount into effect.

Cleveland Employment High

OCTOBER industrial employment in Greater Cleveland continued at stable levels, a stability which has now prevailed for more than two years, according to a Cleveland Chamber of Commerce survey.

An estimated 211,800 hourly paid employees were on payrolls of all greater Cleveland manufacturers on Oct. 26.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Court decision upholding "overtime on overtime" to longshoremen is not proving to be as harmful to industry in general as had been widely predicted

THE SUPREME COURT'S decision upholding the principle of paying "overtime on overtime" to longshoremen employed on sporadic days and at sporadic hours when a ship comes in for loading or unloading (Bay Ridge Operating Co. and Huron Stevedoring Corp. cases) is not proving the threat to industry in general that was widely predicted.

Enforcement of the opinion, originally to date from Sept. 15, became effective Oct. 18 following the court's refusal to grant a rehearing in these two actions. However, Wage & Hour Administrator William R. McComb announced, right after the decision was handed down last June, the procedure he would follow in applying the Supreme Court's interpretation. Since that time he has received large numbers of inquiries from both management and labor in many industries to determine whether compensation presently paid for work on irregular schedules meets the requirements.

In the great majority of instances —in fact, in almost 100 per cent of the cases—he has advised that existing compensation patterns are in the clear. Very few industries have the conditions that characterize the longshore business, when ships arrive for servicing at all sorts of times, often on Saturdays, Sundays, at night or about sunup in the morning.

Depends on Two Conditions—In advising employers or labor representatives on possible changes in compensation patterns, the administrator considers two conditions which must be reflected in the particular employment: 1—The employment must be of a sporadic character as to hours or days worked, and 2—There must be a definite agreement providing premium rates of pay for the hours and days of sporadic employment without reference to the number of hours or days previously worked in the week. Where these two conditions are present the premiums are deemed to be paid for the undesirability of the hours and therefore cannot be considered as contributing true overtime. Consequently, when computing for overtime over 40 hours in a week, these premiums for undesirable hours must be made part of the regular rate of pay.

The formula for calculating overtime in such a situation is this: Total earnings at straight time (the sum of the earnings at the contract rate in the nonpremium hours plus the earnings at premium rates for work during the premium hours) divided by the number of hours worked determines the hourly rate of pay. This rate is paid for the first 40 hours, with time-and-a-half rate applying to work in excess of 40 hours.

In all cases where the above two conditions are not present—that is, employment at sporadic times, and a specific agreement providing premium rates for such employment—the employer is deemed to comply with the statutory requirements when he pays premium rates as true overtime for work in excess of 40 hours a week.

Few Changes Necessitated—One of the few cases in which a change has been necessitated involves a ship repair plant at a tidewater location. At this plant the hours are highly sporadic, the men going to work whenever a ship comes in for repair work. So far few steel companies and few metalworking companies have queried the administrator as to where they stand under the court's interpretation. So far, the compensation patterns which have raised questions in these industries have been found to meet statutory requirements.

Employers confronted with problems or questions in regard to their compensation practices are advised in all cases to submit them to the Wage & Hour Division for a ruling. These questions should be submitted to the regional offices at Boston, New York, Philadelphia, Birmingham, Cleveland, Chicago, Kansas City, Mo., Dallas, Tex., and San Francisco, or to its branch offices at Raleigh, N. C., St. Paul, Minn., and Santurce, San Juan 1, Puerto Rico, Juneau, Alaska, and Honolulu 2, Territory of Hawaii. Or the questions may be submitted to headquarters, Washington 25, D. C.

In many cases the inquirers are given helpful information as to how, by making minor changes, they can get clearance with the law without changing their work schedules or compensation patterns. For example, some employers with work-weeks starting on Tuesday or Wednesday have come into compliance by changing to Monday as the starting day. As a result the premium days of Saturday and Sunday normally fall after 40 hours of work, so that work performed on those days constitutes true overtime.

There is a further advantage in asking the Wage & Hour Division for an interpretation. That is because of the provision in the Portal-to-Portal Act of 1947 (Section 9) that no employer is liable under the Fair Labor Standards Act, the Walsh-Healy Act or the Bacon-Davis Act if he can prove that he acted in good faith in conformity with "and in reliance upon any administrative regulation, order, ruling, approval or interpretation of any agency of the United States."

How To Avoid Labor Troubles

"MUST" READING for personnel men striving for smooth collective bargaining techniques is a new 61-page description and analysis of the labor-management relations of the Libbey-Owens-Ford Glass Co. and the Federation of Glass, Ceramic and Silica Sand Workers of America. It is the second booklet in a series prepared by the National Planning Association, 800 Twenty-first Street N. W., Washington 6, D. C., under the title "Causes of Industrial Peace under Collective Bargaining." The report, written by Frederick H. Harbison and King Carr, of the University of Illinois Industrial Relations Center, is available at $1 per copy.

To Assist Aircraft Builders

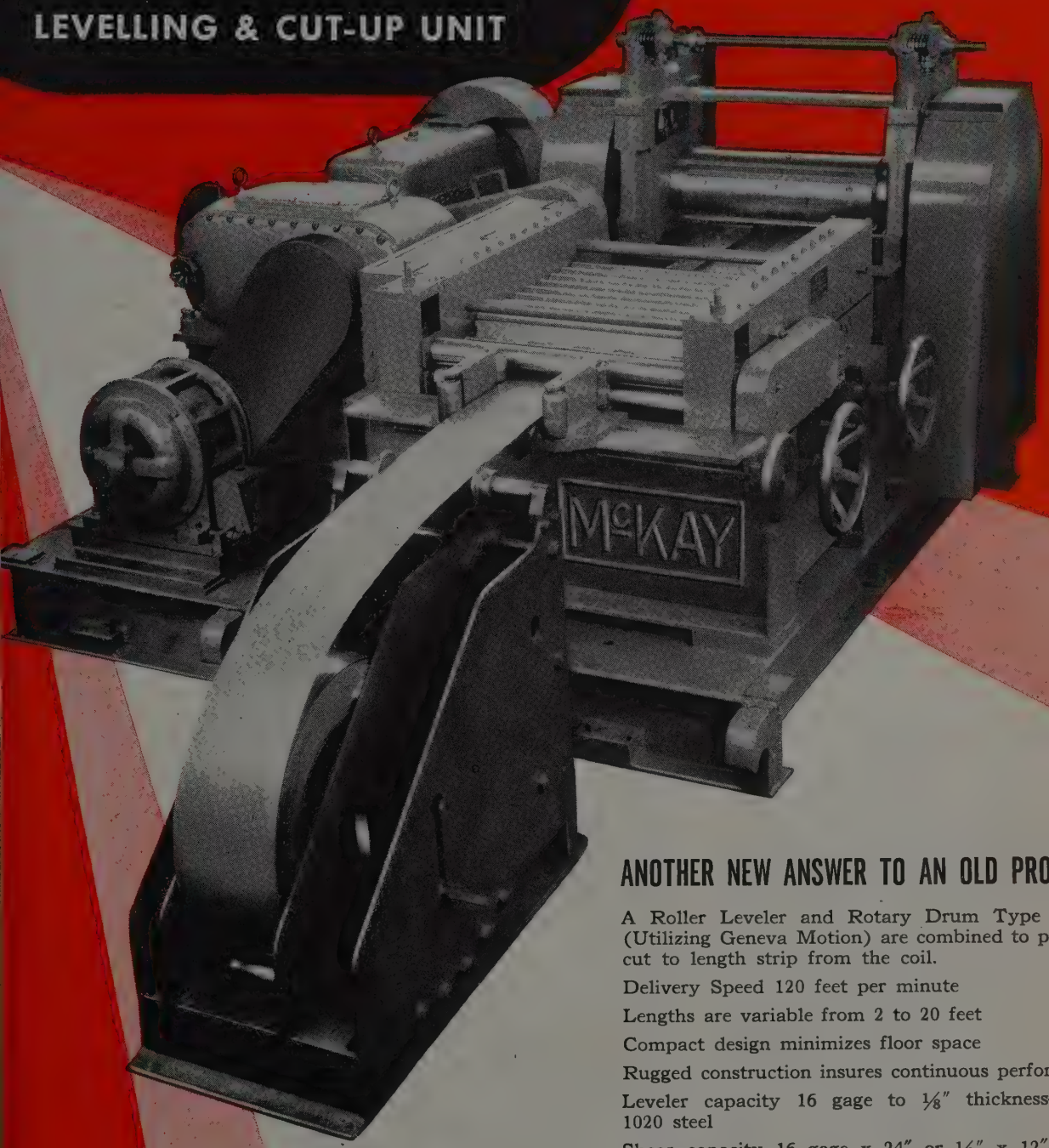
AN AIRCRAFT Scheduling Committee just set up by the Munitions Board at Wright-Patterson Field, Dayton, O., is to serve as a central point to which aircraft companies and their suppliers can go for assistance on problems involving materials and components. The new committee will provide assistance on such problems in connection with contracts both of the Air Force and the Navy Bureau of Aeronautics.

Discuss Mobilization

WAR MOBILIZATION plans for the truck-trailer industry were discussed Nov. 4 at a meeting at the National Security Resources Board presided over by Fred Glover, director of the Automotive Division of the board's Office of Production. A task group of three men represented the industry: Julius Glick, president, Truck

McKAY

LEVELLING & CUT-UP UNIT



ANOTHER NEW ANSWER TO AN OLD PROBLE

A Roller Leveler and Rotary Drum Type She
(Utilizing Geneva Motion) are combined to produ
cut to length strip from the coil.

Delivery Speed 120 feet per minute

Lengths are variable from 2 to 20 feet

Compact design minimizes floor space

Rugged construction insures continuous performa

Leveler capacity 16 gage to 1/8" thickness—S
1020 steel

Shear capacity 16 gage x 24" or 1/8" x 12"—S
1020 steel

Engineered for low cost high speed productio

The **McKAY MACHINE** *Compa*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPM

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

PATTON TANKS: Army's new M-46 tank, named for Gen. George S. Patton Jr., is shown undergoing tests at the Aberdeen Proving Grounds in Maryland. It possesses greater speed and maneuverability than earlier models. Above, the Patton, front, turns in a smaller radius than the Sherman tank, rear. The Patton has a cross-drive transmission and hydraulic drive. NEA photo

Engineering Corp., Cleveland; Harvey Fruehauf, president, Fruehauf Trailer Co., Detroit; and Frank Schotters, vice president, Trailmobile Co., Cincinnati. Arthur M. Hill, chairman of the NSRB, said that in the event of another war emergency the truck-trailer industry will be an essential element in meeting emergency transportation needs. Recommendations reached at the meeting of Nov. 4 will be submitted for review by a Truck-Trailer Industry Advisory Committee to be appointed later.

Russian Reports Available

INFORMATION on Russian research and development work has not been readily available in this country to industrial and laboratory workers because of the policy of the Soviet government in limiting the number of copies of its technological publications which may be sent to outsiders. This condition is about to be remedied by the Office of Technical Services, Commerce Department, which plans to make photostatic copies of Russian technical articles available to Americans. They will start to be listed soon, at nominal prices, in the Monthly Bibliography of Scientific and Industrial Reports issued by the OTS.

Reports on Iron Powder

AN IMPORTANT contribution to the literature on iron powder metallurgy will be made available by the Office of Technical Services, Commerce Department, for public sale late in November. It is a report by Stevens Institute of Technology and sets forth results of research under an OTS contract which Stevens conducted on the effect of particle size on powder metallurgy. Title will be: "Determination of the Effect of Particle Size on the Properties of Commercial Iron Powders and Compacts Made from these Powders by Conventional Cold Pressing and Sintering Techniques."

As an outgrowth of this research, Stevens Institute now has a contract from Army Ordnance to develop the use of iron powder in making the rotating bands on projectiles. Purpose is to conserve scarce copper from which these bands now are made. In the iron powder bands a porous structure is contemplated; this, it is expected, can be impregnated with paraffin or some other lubricant which, in addition to facilitating free rotation of the projectile, will cut down on erosion and thus lengthen the firing life of gun barrels. That, again, would cut down on the amount of steel and the amount of machine shop time used in manufacturing gun barrels during a war.

To Quiz FTC on Pricing

THE 4600-WORD memorandum in which the Federal Trade Commission summed up its policy in regard to geographic pricing practices (STEEL of Oct. 25, p. 40) fails to clear up confusion as to the legality or illegality of pricing methods in general, in the opinion of William Simon, general counsel to the Senate Trade Policies (Capehart) Committee. It has been picked apart by Mr. Simon and will be the basis for some penetrating questions to be asked of the commission's members and legal staff when they appear at the committee's hearings next week.

Business Census Results Soon

BUREAU of the Census has begun releasing results of its 1947 Census of Manufactures. The lumbering industry is the first to be considered, but preliminary information respecting other industries will be released the latter part of November and will continue into the first quarter of 1949. Information will include statistics on employment, payrolls, manhours worked, inventories, capital expenditures, value added by manufacture, and in some cases value of shipments and detailed product data.

Under provisions of the law approved June 19, 1948, the next Census of Manufactures will be taken to cover activities in 1953 and thereafter at five-year intervals, instead of every two years as before the war.

Benefit Programs Increase

THREE MILLION workers in the United States were covered by health, welfare or retirement benefit plans under collective bargaining agreements by mid-1948. This, says the Bureau of Labor Statistics, is a substantial increase in coverage since the war.

About 45 per cent of the three million workers are covered by plans which provide health and welfare benefits, except retirement; about 44 per cent are covered by pensions in addition to one or more health and welfare benefits; and about 11 per cent are covered solely by retirement or pension provisions.

Apprentices Increase

NUMBER of registered apprentices in four major machining trades increased 50 per cent over a 12-months period.

This increase put the number of machinist, tool and die maker, auto mechanic and airplane mechanic apprentices listed with the Federal Committee on Apprenticeship or a State Apprenticeship Council to 54,500 on July 1, 1948, compared with 36,200 on the corresponding date of 1947. The 1948 figure is comprised of 16,800 machinists, 22,300 auto mechanics, 13,800 tool and die makers, and 1600 airplane mechanics. These totals, however, do not represent complete coverage of the country but only those listed with the Federal Committee on Apprenticeship or a State Apprenticeship Council.

Metal-Saving Development

Services work on ways to save steel used in cartridge cases. Plastics may be answer

SINCE the Army Ordnance Department decided recently that it had made its last brass cartridge case and that all cartridge cases hereafter will be made of steel, the common impression has been that strip and sheet steel would become practically nonexistent in another war insofar as ordinary civilian requirements are concerned.

Now, by reason of a development Navy Ordnance has under way, this outlook may improve in the near future. Navy Ordnance has developed plastic cartridge cases which meet requirements. There is only one drawback, and that is that there is not nearly enough plastic raw material to feed cartridge case production lines on the scale that would be necessary in war.

Various ways and means of pushing up production of such materials is under study but so far no program has been decided on. The cost would be heavy. Further, a large quantity of scarce steel would have to be used in setting up new plastic material production capacity.

The plastic cartridge case work is being carried on at the new $17 million Naval Ordnance Laboratory at White Oak, Md. There, in one of the 100 or so buildings comprising this enormous establishment, notable progress is being made in the use of plastic parts. The aim is to produce in plastics such parts as give best service when made of plastics. But the net effect is to reduce consumption of metals. Plastic parts are used particularly in devices employing magnetic and electronic principles in their operation—in other words, devices which operate less efficiently when made of metal. For example, magnetic mine fuses now are made of plastic parts entirely.

Occupying 1000 unscarred acres in the beautiful wooded, rolling Maryland countryside, the new Naval Ordnance Laboratory is truly a far cry from the days of shot and shell. A couple of the show pieces are the first 10,000,000-volt completely mobile betatron unit capable of taking X-ray photos through 16 inches of steel, and the world's largest wind tunnel brought here from Germany. This wind tunnel, incidentally, is the one in which the German V-2 rocket was developed. The range of other equipment and instrumentation is vast, running into the thousands of items.

Facts for Industry . . .

Gray Iron Castings

Shipments of gray iron castings, including soil and pressure pipe, during August totaled 1,050,948 short tons, 15 per cent higher than July shipments of 914,464 tons and 10 per cent higher than August, 1947, shipments of 951,859 tons. Miscellaneous gray iron castings shipments amounted to 663,007 tons in August of which 312,042 tons were for sale. Shipments of molds for heavy steel ingots totaled 170,642 tons in August, 13 per cent above July shipments of 150,947 tons. August shipments of chilled iron railroad car wheels were 59,501 tons, 17 per cent higher than for the preceding month. Cast iron pressure pipe and fittings shipments at 105,226 tons and cast iron soil pipe and fittings shipments at 52,572 tons for August were 25 and 26 per cent higher respectively, than totals for July. *Census Bureau, Commerce Dept.*

Truck Trailers

Production of truck trailers during August amounted to 3622 units, representing a 5 per cent increase over the 3437 units produced in July and 16 per cent above the August, 1947, output. Of the complete trailers produced during the month, vans accounted for 54 per cent and platforms for 19 per cent of the total. Shipments of truck trailers during August totaled 4196 units with a value of $12.8 million. Of this total 4028 were shipped as complete trailers and 168 were shipped as trailer chassis. August shipments increased 11 per cent in number and 16 per cent in value from the 3773 units valued at $11 million shipped during the previous month. *Census Bureau, Commerce Dept.*

Steel Castings

Totaling 140,223 short tons, shipments of steel castings in August represented an increase of 16 per cent over shipments of 120,405 tons in July. Shipments for first 8 months of 1948 at 1,154,000 tons were 9 per cent higher than the total shipments in the same period of 1947. Steel castings shipped to the trade represented 77 per cent of all shipments during August and were 22 per cent higher than the July totals. Unfilled orders for steel castings for sale to the trade at the end of August amounted to 472,481 tons, a drop of 5 per cent from the orders on the books at the end of July. *Census Bureau, Commerce Dept.*

Steel Forgings

Commercial steel forgings shipments during August totaled 111,097 short tons, 14 per cent higher than July shipments of 97,455 tons. Total shipments of 917,265 tons for the first 8 months of 1948 were 4 per cent higher than the 880,559 tons shipped during the same period of 1947. Unfilled orders for steel forgings at end of August amounted to 634,148 tons, a slight increase over orders on the books at end of July. Drop and upset forgings shipments amounted to 79,212 tons in August and press and open hammer shipments totaled 31,885 tons. *Census Bureau, Commerce Dept.*

Aluminum, Wrought

Shipments of aluminum wrought products in August totaling 135,196,000 lb were 3 per cent higher than the 131,028,000 lb shipped in July. For the first 8 months of 1948 total shipments of more than 1.1 billion lb are considerably above the 869 million lb shipped in the same period of 1947. Increase in the August shipments was principally accounted for by increased shipments of plate, sheet and strip which totaled 103 million lb compared to 99 million lb shipped in July. Balance of the month's shipments consisted of 15.6 million lb of rolled structural shapes, rod, bar and wire; 14.6 million lb of extruded shapes, tube blooms and tubing; and 1.9 million lb of powder, flake and paste. *Census Bureau, Commerce Dept.*

Malleable Iron Castings

Malleable iron castings shipments during August totaled 73,273 short tons, 13 per cent above July shipments of 64,995 tons. Shipments for first 8 months of 1948 totaled 616,401 tons, 5 per cent higher than for the same period in 1947. August shipments of rough castings to outside trades were 41,088 tons, representing 56 per cent of total. New orders booked, less cancellations, for sale to outside trades during the month amounted to 37,491 tons, a slight increase over July bookings. *Census Bureau, Commerce Dept.*

U.K. Steel Nationalization?

Passage of measure not certain despite two-to-one Labor majority in Commons

BRITAIN has moved one step closer to nationalization of its steel industry with introduction in Parliament of a bill on the controversial issue. This comes in spite of the industry's steadily increasing production.

Although Britain's Labor government holds a two-to-one majority in the House of Commons, adoption of the nationalization measure is by no means certain. Conservatives promise to fight it to the last ditch. Public ownership of other industries, notably coal and the railroads, has been very expensive. British steelmen are solidly against the bill. Ambiguities in the measure also make passage uncertain. Just who will run the industry, for example, is not clear. The taking over of integrated plants may also raise objections because the government in so doing will enter fertilizer, chemical and fabricating fields in competition with privately owned firms.

Provides for Giant Corporation — The plan, to go into effect May 1, 1950, or 18 months after passage, provides that an Iron & Steel Corp. of Great Britain be formed to take over the securities of 107 major firms carrying on the process of digging iron ore, converting pig iron and scrap iron into steel ingots, and shaping steel by the rolling process. The only integrated plants which are excluded are those making both steel and automobiles. Ford which has a blast furnace is the outstanding example.

Total capital of the 107 companies is about $780 million. Employees, including those of subsidiaries, number about 300,000. Owners of the companies affected will get initial compensation amounting to $1.2 billion in the form of government securities. Firms will retain their names and trade names. Although the Minister of Supply will have the power to appoint company directors, individual managements will be changed, if at all, only gradually. Under the program, companies will prepare trading balance sheets which they will submit to the corporation, which itself will prepare a consolidated balance sheet.

Consumers' Committee Set Up— Controversial aspects of the measure include consumers' committees to be set up to protect the interests of those steel users who remain privately owned. These companies maintain that this will be inadequate. Management men in firms to become publicly owned also point out that procurement provisions for them, as stated in the bill, are vague. Another serious objection is that the measure fails to make clear how much power will be vested in the hands of the Minister of Supply and how much in the new steel corporation.

Small Firms Get Licenses—Of the small firms not taken over, those producing up to 50,000 tons of ore annually, or 20,000 tons of basic steel products, will need and receive licenses to continue operating. Companies producing less than 5000 tons a year may continue without a license.

The extent to which the steel industry will be taken over is indicated as follows: Iron ore 97.5 per cent; pig iron 97.6; steel ingots 99.6; alloyed steel 93.7; hot-rolled sheets 94.1; plates 97.3; tin plate 88; heavy forgings 44.5; drop forgings 15.8; steel castings 23; tires, wheels and axles 94.3; wrought iron and steel pipe fittings 67.2; hard and mild steel 60; cold-rolled steel 72.5; light steel bars 40.7.

LARGEST IN EUROPE: Foundation forms for what will ultimately be the largest blast furnace in Europe. Located at Port Talbot, Wales, this unit is part of extensive construction for Steel Co. of Wales, recently formed to unite four firms in the area. Total project will be completed in 1951 at a cost of more than $240 million. Wide World photo

Western Germany

SIGNIFICANT change in the structure of the West German steel industry may also be in the making. American pressure has been brought to bear, and the trust-busting phase of Allied postwar economic policy in Germany may soon end.

The tremendous subsidies necessary to keep the 30 new "severed" steel companies alive, coupled with the furor which these firms made when price increases were refused, have been influential in modifying Allied policy. For the time being these companies will remain separated, but prospects are good that some may be returned eventually to their parent firms. No more steel companies will be broken up.

Indicative of the new economic policy toward Germany is the American-induced plan to modify the dismantling program. Britain and France have agreed to suspend removal of some 350 industrial plants from Germany until an American committee can determine whether the factories should remain where they are for the sake of the European Recovery Program. The agreement is admittedly a compromise. The U. S. wanted the dismantlings stopped entirely, but the other two Allied powers refused to go this far. Instead they agreed to dismantle the plants in such a way that the parts can be reassembled, if necessary, on the original site, and to leave the parts at the site pending the committee's ruling. The factories number about a third of the 915 plants originally marked for removal. Most are in the Ruhr, the British zone.

France

ECONOMIC structure in France is becoming increasingly riddled as the

result of a barrage of "rolling strikes." A long series of strikes in one industry or segment of an industry after another, each lasting only a day or two, is having the same effect as a general walkout. Although these disturbances are Communist-inspired, the real core of dissatisfaction is the fact that wages have no sensible relationship with soaring prices.

Despite the gloomy outlook, the French see some hope in the improving production of cars and trucks. During the first eight months of this year, output of 125,600 units was 11 per cent above production for the corresponding period of 1938 and almost equaled the output for all of 1947. France now is the fourth largest producer in the world, following the United States, Great Britain and Canada. About 85 per cent of the cars and 30 per cent of the commercial vehicles made in France are exported. One model for which the French have high hopes is the 2 horsepower Citroen which is capable of phenomenally high gasoline mileage and which sells for $700.

Eastern Germany

POLISH-Czechoslovakian Economic Cooperation Council has decided to develop the heavy industry region of Upper Silesia into an Eastern Ruhr with an annual production of 10 million tons of steel and 120 million tons of coal. Canals connecting the Danube and Oder rivers with the Vistula and Dnjestr rivers, which had been started by the Germans, will be resumed.

Of the recent $450 million credit given by Russia to Poland and Czechoslovakia, about $150 million has been allotted to the erection of a large steel combine near Gleiwitz in Upper Silesia, which would produce 1.5 million tons of pig iron and 1 million tons of steel annually beginning in 1952. Russian specialists have been assigned to the job. The proposed canal system would bring Russian manganese ores within water-reach of this facility.

Steel Export Quotas Cut

STEEL product export quotas for the fourth quarter have been reduced 60,000 tons from those authorized for the third period, according to the Office of International Trade, Department of Commerce. Total fourth-quarter quota of all iron and steel products allocated for export amounts to 1,059,000 tons.

Country quotas for the principal products or product groups have been established as follows in tons: Iron bars and hot-rolled carbon steel bars, 125,000; concrete reinforcing bars, 35,000; cold-finished steel bars, 17,000; hot-rolled alloy steel bars 17,000; boiler plate and other carbon steel plate, 90,000; alloy steel sheets, 14,000; carbon steel and iron sheets, 84,000; iron galvanized and steel galvanized sheets, 15,000; seamless casing and oil line pipe, 70,000; welded casing and oil line pipe, 37,000; welded black pipe, 18,000; seamless black pipe, 9000; galvanized steel pipe, 14,000; black and galvanized wrought iron pipe, 3000; seamless and welded boiler tubes, 13,000; iron and steel pipe, n.e.s., 14,700; rails, 60 lb and over, 60,000; rails under 60 lb. 6500; relaying rails, 20,000; rail joints, tie plates, etc., 18,500; structural shapes, unfabricated, 64,000; fabricated structural shapes, 51,000; unlined storage tanks, 35,000; hot and cold-rolled carbon steel strip and hot and cold-rolled carbon steel hoops, etc., 30,000; carbon steel billets, 32,500; carbon steel ingots, 20,500; wire rods, 10,500; uncoated wire, 17,500; coated wire, 17,500; barbed wire, 12,500; cast iron pressure pipe and fittings, 12,000.

No country quotas were established for products for which there are highly specilized demands, or which are licensed for export in such small quantities that their inclusion in country quotas would not be justified. Applications for licenses to export the following commodities will be approved only after thorough examination of the end uses designated in the applications: Seamless casing and oil line pipe, 70,000; welded casing and oil line pipe, 37,000; fabricated structural shapes, not including prefabricated houses, 51,000; unlined storage tanks, 35,000; rails under 60 lb, 6500; relaying rails, 20,000; rail joints, splice bars, etc., 18,500; cast iron pressure pipe and fittings, 12,000; seamless black pipe, 9000; carbon and alloy steel forgings, 9000; wire cable and rope, 6900; woven wire fencing, 4000; black and galvanized wrought iron pipe, 3000; fabricated plates, 7000; penstocks, 5000.

Postwar Boom Over?

BUSINESS may have passed the peak of the postwar boom, is leveling off but will continue in substantial volume for the remainder of this year and could react with an upsurge, according to the Business Survey Committee, National Association of Purchasing Agents.

Of the reports received, 70 per cent indicate that October production continued at a high rate. Backlogs are slightly improved over September but much lower than January's high. There are, however, more soft spots developing in the markets, confirming earlier reports that supply is catching up with demand in many lines and, in some, has now overshot demand. Opinion is mixed whether speedup of defense and ECA buying will strengthen all current soft spots.

Purchased industrial inventories were down in October with every indication that rigid inventory control policy predominant in industry for several months will continue. Management is holding inventory investment to lowest possible levels.

Continuing the short-range policy on commitments, 95 per cent of firms covered in the reports are within the 90 day category and 67 per cent of this number are under 90 days. Purchasing agents are taking a very cautious attitude as reports indicate that trend toward competitive markets is developing faster than is generally realized.

Calendar of Meetings . . .

Nov. 8-9, Materials Handling Conference: Second annual meeting, sponsored by Westinghouse Electric Corp., at Hotel Statler, Buffalo.

Nov. 12, Pittsburgh Section of Open Hearth Committee, Iron & Steel Division, and Pittsburgh Section, AIME: Annual fall meeting, William Penn Hotel, Pittsburgh.

Nov. 14-17, National Tool & Die Manufacturers Association: Annual meeting, Hotel Schroeder, Milwaukee. Association headquarters are at 1412 Union Commerce Bldg., Cleveland.

Nov. 17-18, American Zinc Institute: Meeting of the Galvanizers Committee, Roosevelt Hotel, Pittsburgh.

Nov. 18-19, National Founders Association: Annual meeting, Sheraton Hotel, Chicago. Association executive vice president is L. E. Roark, 120 S. LaSalle St., Chicago.

Nov. 18-19, American Management Association: Production conference, Drake Hotel, Chicago. Association headquarters are at 330 W. 42nd St., New York.

Nov. 28-Dec. 3, American Society of Mechanical Engineers: 69th annual meeting, Hotel Pennsylvania, New York. Society headquarters are at 29 W. 39th St., New York.

Nov. 29-Dec. 4, 18th National Exposition of Power & Mechanical Engineering: Power Show, Grand Central Palace, New York.

Dec. 2-4, Society for Experimental Stress Analysis: Annual meeting, Hotel Commodore, New York. Society address is P.O. Box 168, Cambridge, Mass.

Dec. 2-4, Electric Furnace Steel Committee, Iron & Steel Division, AIME: Sixth annual conference, William Penn Hotel, Pittsburgh.

Dec. 6-8, American Institute of Electrical Engineers: Conference on electric welding, Rackham Memorial Bldg., Detroit. Institute headquarters are at 33 W. 39th St., New York.

Dec. 7-8, Diesel Engine Manufacturers Association: Meeting at Union League Club, Chicago. Association headquarters are at 1 N. LaSalle St., Chicago.

Dec. 26-31, American Association for Advancement of Science: Annual meeting, Stevens and Sherman Hotels, Chicago.

new Bullard type "K" economies widen scope of MULT-AU-MATIC method

Higher Speeds Meet New Job Requirements. Designed to lower production costs of small and medium sized jobs in cast iron, steel and light metal alloys, the new BULLARD Type "K" Mult-Au-Matic provides a wide range of spindle speeds up to 900 rpm to get full productive capacity out of modern cutting tools.

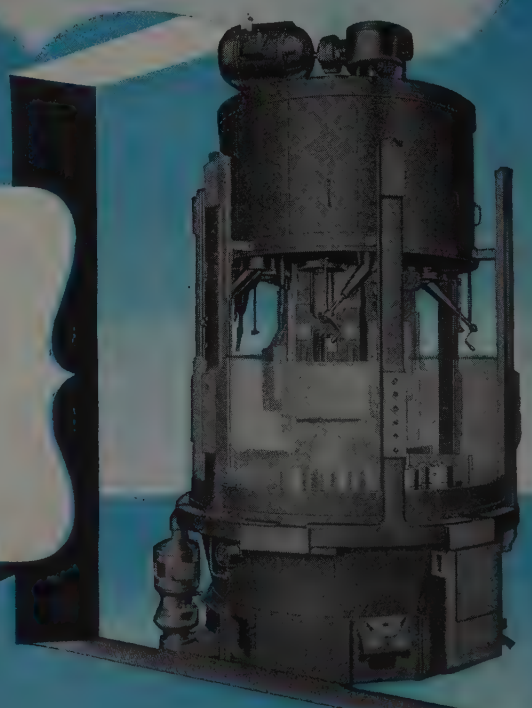
Saves Time Between Cuts. A newly developed index control mechanism permits faster return and advance of tool carrying heads and faster carrier index.

Higher Degree of Accuracy. New method of carrier index registry maintains repetitive accuracy from station to station, producing work to extremely close tolerances.

Improved Hydraulic Chucking Increases Efficiency. Work is chucked quickly by foot treadle control and automatically released as spindles return to loading station. Chucking pressure is adjustable to suit work characteristics.

Twin Spindles Double Production. Two of the four Type "K" models have twin spindles that deliver two finished pieces for every index cycle . . . a promise of lower production cost that is worth investigating further.

Write for complete information about the new Type "K" version of the Mult-Au-Matic method, one of the leading contributors to our modern American production system. THE BULLARD COMPANY, Bridgeport 2, Connecticut.



BULLARD Type "K" Mult-Au-Matics for work up to 10" in diameter come in four models: 6 or 12 spindles with speeds from 100 to 900 rpm, and 8 or 16 spindles with speeds from 98 to 880 rpm. 41 speed changes, 82 rates of feed, selective feeds and common speeds at all stations.

BULLARD

BULLARD CREATES ***NEW METHODS*** TO MAKE MACHINES DO MORE

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Replacement parts business tapers as inventories of distributors and retailers grow . . . Tool and die business off, due partly to seasonal influences, partly to costs

DETROIT

REPLACEMENT parts business is tapering from its highs of the past few years, having dropped off about 20 per cent in the past 12 months, mainly because shelf inventories of distributors and retail outlets have been filled and in some cases are nearly bursting the seams. However, manufacturers are not too worried over this decline, being more concerned with how to effect savings in manufacturing costs.

Tool, Die Business Dull

ANOTHER sharp falling off in business has been experienced by local tool and die shops in the past month or two, only three or four of the larger companies in this field managing to keep fairly busy at the present. The owner of one die shop said: "We thought we were scraping the bottom of the barrel, but when we looked more closely we found there was no bottom in the barrel."

Explanation is partly seasonal, partly the result of soaring costs for new tools and dies which estimates indicate are anywhere from two to five times what they were prewar. While a new program for the General Motors restyled "B" body has been expected in the light of unofficial comment that it would be ready for introduction in the first half of next year, Detroit tool shops say they have received no inquiries as yet.

Installing New Presses—Two of the principal body die plants here are installing exceptionally large tryout presses which will accommodate the biggest body dies yet made. Normally such dies are moved to the plant of the body manufacturer or automobile company ordering them, for tryout in production presses. By installing suitable press equipment at the die shop it will be possible to save time and expense in putting finishing touches on large dies. At the same time, however, the die shops will have to figure out some way to amortize the high cost of this equipment on a reasonable basis.

Frederick Colman & Sons Inc., for example, has under way a 100 x 150 ft building addition, 40 ft in height, where complete die tryout facilities will be installed, featuring two triple action presses with 100 x 204-in. bed size. Here a full line of presses can be tooled and sample parts run for a customer before the dies are delivered, insuring the user the shortest possible down time when model changeovers are made. The shop addition will be ready some time next spring, in time to handle some of the 1950 model work. Buell Die & Machine Co. is understood to be planning a similar tryout installation.

Seek Diversification — Other die shops have turned to diversification of their business in order to fill voids created by lax periods in die construction. Davis Tool & Engineering Co. has organized a fully-equipped stamping division in connection with its new tool and die shop on Plymouth Road and since July has been working full tilt producing some 150,000 stainless steel windshield visors for a Chicago merchandiser who distributes them nationally through chain outlets.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,236	366,205
February	399,471	393,663
March	519,154	443,588
April	462,323	445,137
May	359,996	404,191
June	454,401	421,466
July	489,736	399,456
August	478,146	364,478
September	437,181	444,501
October	506,539*	461,536
10 mos.	4,525,000*	4,144,221
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.

Estimate for week ended:

	1948	1947
Oct. 16	123,185	89,100
Oct. 23	123,067	106,159
Oct. 30	116,413	107,240
Nov. 6*	122,000	106,651

Estimates by Ward's Automotive Reports

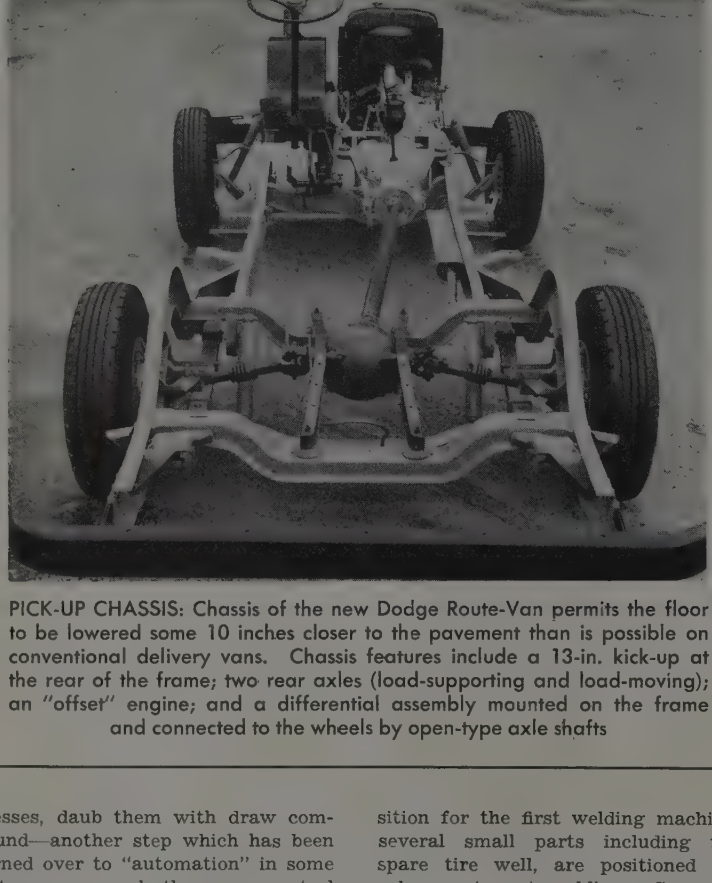
New Stamping Technique

A COMPARATIVELY new technique in pressed metal operations, along with a new word to describe it, is under development by plant engineers at Ford. Known as "automation," it is concerned with the automatic mechanical handling of parts, principally larger pieces, between press operations and from press forming to further steps such as assembly, welding, etc. In a way it might be compared with the transfer-type machine tool line which automatically moves parts from one machining station to the next in sequence, except that in the press line mechanical fingers or hands literally pull the piece from a press and deposit it on a conveyor leading to the next press, whereas in transfer-type machine tools the movement of parts is entirely by conveyors or pushers working in conjunction with plant conveyors.

D. S. Harder, now heading up Ford manufacturing, is a former Fisher Body executive and while there played a leading part in the adaptation of mechanical handling of stampings between press operations. It was not called automation then, but the technique is similar as practiced at Ford. Currently, the system has been adapted to several lines in the Ford pressed steel department, in the frame plant and at a parts plant in Hamilton, O. Further applications are in the works, schedules for installation as fast as engineers can work out the handling techniques and equipment.

Each installation is unique. On a door panel line, for example, after the first draw on a blank, a hinged steel arm, fitted with an electrically controlled gripper, moves automatically between the raised dies to grasp the stamping, moves it out onto a transfer mechanism which automatically turns the piece over by means of a hinged arm and feeds it into the trim press. Action of the gripper arm is controlled electrically through limit switches connected to the press ram. Similar type of transfer mechanism handles the stamping from the trim press to a flanging press.

Safer, Faster, Surer—Conventionally, pressmen feed blanks into the



PICK-UP CHASSIS: Chassis of the new Dodge Route-Van permits the floor to be lowered some 10 inches closer to the pavement than is possible on conventional delivery vans. Chassis features include a 13-in. kick-up at the rear of the frame; two rear axles (load-supporting and load-moving); an "offset" engine; and a differential assembly mounted on the frame and connected to the wheels by open-type axle shafts

presses, daub them with draw compound—another step which has been turned over to "automation" in some instances — push the press control button for its cycle, then grab the formed piece and haul it out of the dies onto inclined skid rails down which it slides to the succeeding operation. The new technique makes the job much safer, faster and surer. It has not been designed primarily to eliminate manpower, rather to reduce the manual effort involved in handling heavy and cumbersome pieces. Size, however, is not necessarily a determinant. The idea has been applied to smaller parts such as gas tank halves, as well as floor pans, inner and outer door panels, spare tire wells, quarter panels and frame members.

Mechanical handling of this type is not confined solely to press operations. In fabrication of rear floor pans, following the forming operations is a transfer mechanism for moving stampings automatically through two multiple spot-welding machines. Six stampings are positioned on the unit for each cycle—two for preparation ahead of the first welding unit, one in each welding machine, one between the welders and the last in the unloading station. As the floor pan reaches the loading position for the first welding machine, several small parts including the spare tire well, are positioned for subsequent spot welding. Sequence of parts through the following steps is entirely automatic.

Many Devices Specially Designed—Some of the devices in the "automation" setup, such as the mechanical gripper arm attached to presses, are available commercially but most have been designed by Ford production engineering specialists. It is reported some 500 different mechanisms have been approved and the program is moving forward steadily on a long-range basis. Other equipment on press lines includes sheet feeders, extractors, turnovers, stackers, loaders, compound applicators, scrap removers, counters, baggers and the like.

As with all transfer-type systems of production, the vulnerability of each individual mechanism, whether mechanical or electrical, is critical, since it is interlocked with the rest of the line and trouble at one isolated point will stop the entire line.

GM Takes Back Opel

AS OF Nov. 1, General Motors resumed management control of Adam Opel, A. G., at Russelsheim near Frankfurt Am Main, Germany, under control of the Office of Military Government for Germany (U. S.), as custodian, throughout the period of American occupation. Edward W. Zdunek, formerly regional manager for Europe of GM Overseas Operations, becomes managing director of Opel, while the new board of directors includes nine U. S. representatives of GM.

Ownership of the German company was purchased by GM in 1929 and in the ensuing ten years the plant grew to be the largest European producer of automotive vehicles, with annual output of 120,000 cars and trucks. Present capacity, despite the loss of a substantial part of the original facilities, is ample to meet production schedules now contemplated. Parts production was resumed after the end of hostilities and subsequently a limited assembly of passenger cars and light trucks was undertaken. Schedules for 1949 contemplate 25,000-35,000 cars and trucks, some of which will be exported, principally to other European countries. Export percentages and allocations to particular markets will remain under control of occupation authorities.

Opel builds a small passenger car known as the Olympia, smaller and lighter than the average U. S. vehicle, with principal appeal in countries with adverse road conditions, high gasoline costs and burdensome operating taxes.

While GM had written off its Opel assets as a complete loss during the war, it resumed management responsibility at the instigation of military authorities.

Willys To Build Jeep Bodies

BUILDING of all bodies for universal jeeps will be started at the Toledo, O., plant of Willys-Overland in mid-December. Tools, dies, jigs and fixtures for the operation have been transferred there from the American Central Division of Avco Mfg. Corp., Connersville, Ind., where the bodies were built until early in October when production was suspended after completion of a sufficient backlog to carry over the transfer period.

Tool and Die Meeting Planned

NATIONAL Tool & Die Manufacturers Association will hold its annual meeting Nov. 14-17, at Hotel Schroeder, Milwaukee. Shop owners from Boston to Los Angeles are expected to attend.

A. G. Bryant, past president, National Machine Tool Builders' Association, will be one of the speakers at the gathering.

What happens to your drawings?

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Place your drawing on any one of the many Ozalid sensitized materials, feed it into the Ozalid machine, and you will have a positive (not negative) copy, dry-developed and ready to use, in a matter of seconds!

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U.S. Keeps Plants

WAA transfers three Chicago region units to FWA to be kept in stand-by condition

THREE Chicago region war surplus plants which are to be retained by the federal government as part of a national industrial reserve have been transferred to the Federal Works Agency by War Assets Administration.

The plants, to be kept in stand-by condition by the Public Buildings Administration of FWA, are the Gary Armor Plate plant, Gary, Ind.; a magnesium plant in Luckey, O.; and the Badger Ordnance Works, Baraboo, Wis. They cost the government a total of about $66.5 million.

First To Be Transferred—These plants are the first in the Chicago region to be transferred under a law passed by Congress last summer to turn certain industrial plants into the stand-by status rather than to permit their unrestricted sale as surplus property. WAA had found no buyers willing to accept these units on the condition that they be restored to wartime use in the event of an emergency.

The magnesium plant, operated during the war by Magnesium Reduction Co., has a floor area of 177,000 sq ft. The ordnance plant consists of approximately 3218 acres of land and 1180 buildings. The Gary facility has 1,241,000 sq ft of floor space in 18 production units and 67 service and other type units.

Mahoning To Boost Capacity

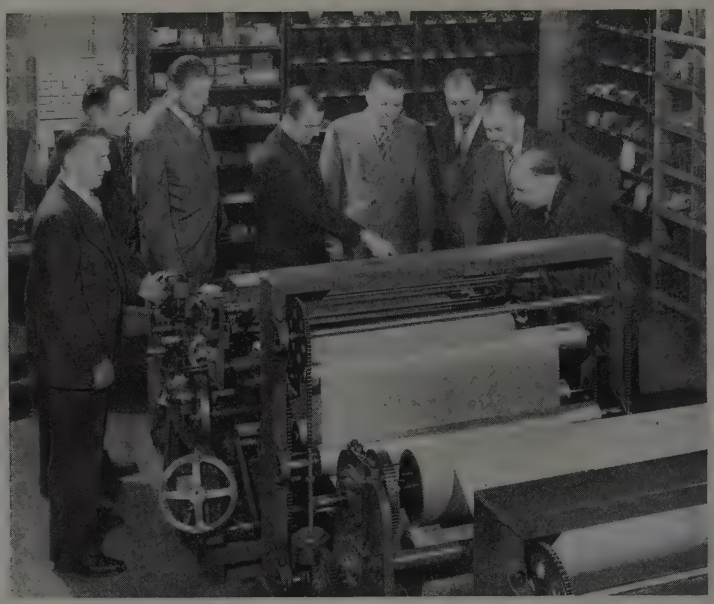
MAHONING Valley Steel Co. will increase its capacity from about 97,500 tons of hot-rolled sheets annually to about 120,000 tons when a $250,000 expansion and modernization program at Niles, O., is completed. Firm is owned by General Electric Co.

Program includes installation of two three-high breakdown mills and four finishing mills. Equipment will cost $150,000 and building additions about $100,000. One purpose of the expansion, according to J. P. Horack, president, is to put Mahoning in better position to compete with big strip mills once the current heavy steel demand is over. Mahoning started in 1916 with eight old-type hand mills which have been modernized into a semi-continuous operation.

Mullins Begins Expansion

MULLINS Mfg. Corp., Salem, O., is spending more than $550,000 on new buildings at its Salem and Warren, O., plants. Construction includes a general office building at Salem and a factory addition at Warren.

The factory addition is to provide more space for production of cabinet sinks and base cabinets. The project, to cost about $375,000, will be finished in May, 1949. The office building, to cost $200,000, is expected to be completed by February. It will house the company's general and executive offices, now located on two floors of the factory building.



SALES CONFERENCE: District engineers of Industrial Ovens Inc., Cleveland, inspect one of the company's new machines for coating paper, textiles, film and foil at a recent sales engineering conference. President C. A. Litzler is shown pointing out some of the new features. Others in the photo are, left to right: A. H. Kruger, Chicago; J. R. Hall, general manager, Cleveland; V. C. Leatherby, Pittsburgh; J. K. Gillett, Cleveland; J. P. Clark Jr., Philadelphia; R. B. Symons, Tiverton, R. I.; E. V. Larson, Toronto, Ont.

Shipbuilding Work Expands

BETHLEHEM Steel Co.'s shipbuilding work accounted for most of the company's increase in third quarter net billings to $324,700,000, highest since 1945.

The corporation has 40 ships under contract, with construction schedules extending through nearly all of 1950. Unfinished ship work now amounts to about $248 million, compared with $171 million at the end of the second quarter.

New Chicago Plant for Gerrard

A. J. GERRARD & Co., Chicago, manufacturer of steel strapping and accessories, is constructing a new one-story, brick and steel plant on a 7800 square foot plot of ground at 1950 N. Hawthorne Ave., Melrose Park, Ill. Occupancy is scheduled for December. The new plant will enable the company to consolidate its downtown office at 221 N. LaSalle St. and its factory at 2526 Willets Ct., and to handle increased business volume.

Gilmore Buys Oregon Steel Mills

GILMORE Steel & Supply Co., San Francisco, has purchased Oregon Steel Mills, Portland, Oreg., for a reported price of nearly $3 million.

For the last five years Oregon Steel has been manufacturing bars, angles and structural materials, largely from scrap. It has the only electric furnaces for that purpose in the state. Gilmore has maintained a fabricating and distributing center at the old Swan Island shipyard for the last two years.

Transport To Be Converted

BETHLEHEM Steel Co.'s shipbuilding division at San Francisco has received a contract for reconversion of the *Winged Arrow*, a naval transport, to a standard C-2 cargo ship. Completion is scheduled for early next year.

Briefs . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Janette Mfg. Co., Chicago, maker of gearmotors, speed reducers and related products, has appointed the following sales representatives: Alton M. Johnson, Minneapolis; Bell Steel Sales Inc., Milwaukee; William S. Turner, Detroit; and W. F. Hardcastle, Atlanta.

—o—

Hagan Corp., Pittsburgh, combustion and chemical engineering firm, has transferred its San Francisco offices and laboratories to 200 Davis St.

—o—

Hansen-Lynn Co. Inc., Los Angeles, has been organized as an outgrowth of Lynn Co., manufacturer of aircraft control apparatus, hydraulic equipment and farm implements. All key personnel and the activities of the new company will remain the same.

—o—

Rockwood Mfg. Co., Indianapolis, has recently expanded its sheave manufacturing facilities by installation of several special machines. This line includes large sheaves up to 84 inches with any number of grooves.

—o—

Youngstown Sheet & Tube Co., Youngstown, reports its Campbell Tube Mills have chalked up a million man-hour record without a disabling accident, the 15th time such a record has been made in the Youngstown district since 1935.

—o—

National Automatic Tool Co. Inc., Richmond, Ind., recently conducted an open house at its plant which was attended by 3200 people.

—o—

McBeth Machinery Co., Pittsburgh, has been appointed exclusive representative in Pennsylvania, West Virginia and Ohio for Hauser Machine Tool Corp., manufacturer of jig borers and other machinery.

—o—

Raybestos-Manhattan Inc., Passaic, N. J., has opened a Los Angeles warehouse and office at 4651 Pacific Boulevard to service and stock rubber goods and packings for industrial and oil field requirements. Schuyler V. V. Hoffman is in charge.

—o—

Nelson L. Davis Co., Chicago, engineering and contracting firm, has been awarded the contract for construction of a heavy media coal processing plant for Youngstown Mines Corp., Dehue, W. Va.

—o—

Resistance Welder Manufacturers Association, Detroit, reports an increase of 10 per cent in shipments of resistance welding equipment in September, compared to August. September figure was more than three times that for the same month of 1939.

—o—

Western Electric Co. Inc., New York, recently held an open house at its Tonawanda, N. Y., plant. Facility, formerly used for airplane manufacture by Curtiss-Wright Corp., was converted by Western Electric to wire and cable production in 1946.

—o—

Hunter Spring Co., Lansdale, Pa., is opening its course on statistical techniques of quality control and inspection in springs to its wire suppliers and others not directly involved in the purchase and use of precision springs.

—o—

Precision Tube Co., Philadelphia, manufacturer of small nonferrous tubing, has nearly completed its $120,000 expansion program, which includes acquisition of additional production capacity, modernization of existing equipment and an increase in plant area.

—o—

Atlas Imperial Diesel Engine Co., Oakland, Calif., has started construction of a $1.5 million glass container plant at San Leandro as part of a diversification program. When in full production, the plant will produce about 500,000 gross of glass containers annually.

—o—

War Assets Administration reports that Joseph P. Day Inc. will conduct a public auction Nov. 16 at the Hotel Secor in Toledo for sale of a Toledo plant operated during the war by National Supply Co. for production of marine reduction gears.

—o—

Lustron Corp., Columbus O., manufacturer of prefabricated steel houses, has awarded a contract to Multi-Hydromatic Welding & Mfg. Co., Detroit, for design and construction of a $90,000 welding machine to effect high production of the roof truss.

—o—

Bituminous Coal Research Inc., Pittsburgh, has opened a branch office at 488 W. Sixth Ave., Columbus, O. Elmer R. Kaiser is in charge.

—o—

Nelson Stud Welding Division, Lorain, O., Morton-Gregory Corp., has gone into volume production on a composite aluminum and mild steel rivet stud, which overcomes the corrosion problem often encountered when aluminum roofing and siding have been secured with steel-plated fasteners.

—o—

Portsmouth Steel Corp., Portsmouth, O., opened a sales office in Detroit on Nov. 1.

—o—

Ingalls Shipbuilding Corp. has begun residual stress measurements for a large, experimental, welded box girder at its Pascagoula, Miss., shipyard. Ingalls built the girders for the Welding Research Council which is sponsoring the research project.

—o—

Lindberg Steel Treating Co., Chicago, has opened a branch at 3537 E. 25th St., Los Angeles. Firm also operates branches at Rochester, N. Y., and St. Louis. The Los Angeles branch was incorrectly described as a new subsidiary of Lindberg Engineering Co., Chicago, in the issue of Nov. 1.

—o—

C. G. Hussey & Co., Pittsburgh, producer and fabricator of copper and brass, is celebrating its 100th anniversary. Company is a subsidiary of Copper Range Co.

—o—

United States Steel Corp. reports that Wilson-Snyder Mfg. Division, Braddock, Pa., of its Oil Well Supply Co. has received a first place safety award from the National Safety Council for 2,250,000 manhours without a single lost time accident. Since June 15, 1945, no employee has been off work due to an accident at this Braddock plant.

—o—

Livingstone Engineering Co., Worcester, Mass., manufacturer of steam generators, announces that its products, which have previously been distributed in northern California by Merrill Co., will now be handled by Merrill-Brose Co., a new subsidiary of Merrill. Merrill, primarily a mining engineering firm, is expanding its sales representative service.

—o—

Titan Metal Mfg. Co., Bellefonte, Pa., manufacturer of brass and and bronze welding rods and related products, has appointed Fulton Supply Co., Atlanta, as a distributor in southwestern United States.

—o—

Porcelain Enamel Institute, Washington, reports that the value of porcelain enamel finished products shipped during last June dropped 8 per cent or $370,000 from the $5 million figure reported for May. June shipments, however, were 7 per cent over the value reported for June, 1947.

The Business Trend

ALTHOUGH industrial activity in the week ended Oct. 30 was slightly below the postwar peak established the preceding week, it still was brisk enough to equal the postwar period's second best mark on STEEL's index, 177 per cent (preliminary) of the 1936-1939 average.

STEEL—Helping to keep the industrial index at a high point is production of steel for ingots and castings at peacetime record levels, the output rate in the week ended Oct. 30 being 99 per cent of capacity. During August and September operations were from 94 to 96 per cent of capacity, while the average for the five reporting dates in October was 97.7 per cent.

AUTOMOBILES—Contributing to the slight decline in the industrial activity index in the week ended Oct. 30 was a more than 6000-unit drop in automobile and truck production, the dip being occasioned by model changeovers and inventory taking. Despite this drop, production of passenger cars in U. S. plants climbed to a new postwar monthly peak of 377,366, topping the mark set in December, 1947. Forecasts point to a record year for U. S. truck production in 1948, surpassing by some 150,000 units the record of 1,237,000 set last year.

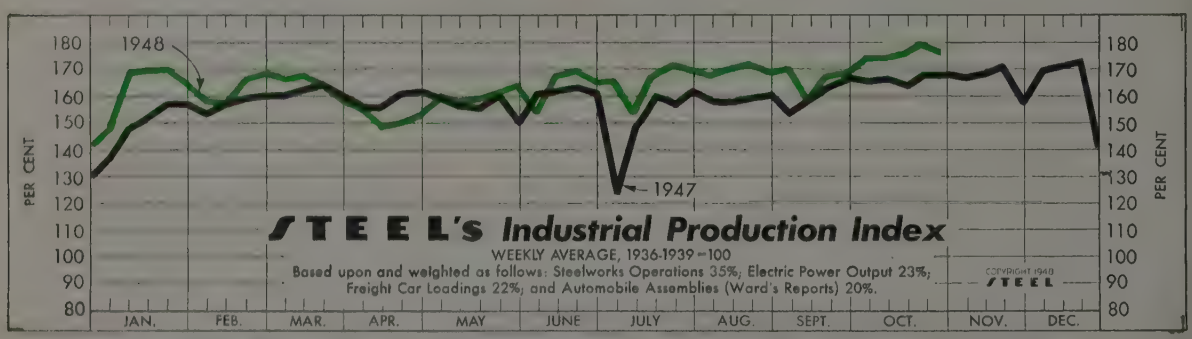
POWER—Electric energy distribution in the week ended Oct. 23 topped the 5.5 billion kilowatt-hour figure for the first time and set a new weekly alltime record. Weekly distribution figures now are twice as high as those in 1939-40 and seem destined to climb still higher as additional generating and distributing equipment becomes available.

COAL—Bituminous coal output for the week ended Oct. 23 exceeded the 12-million-ton figure after seven consecutive weeks below this mark. However, production of 12,070,000 net tons for the week was 656,000 below the corresponding week last year. Stocks, on the other hand, have become so large they are the cause of some concern to the coal industry.

CARLOADINGS—Loadings of revenue freight for the week ended Oct. 23 increased 13,700 cars or 1.5 per cent over the preceding week for a total of 927,532 cars. Although it was a high for the year, this total was 27,095 cars or 2.8 per cent below the corresponding week in 1947.

BUSINESS—Number of new business incorporations granted charters during September rose slightly to 6955 from 6723 in August, according to Dun & Bradstreet Inc. This total, however, was the second smallest in the past 36 months and 19 per cent below the corresponding week last year. Total number of new business incorporations for the first eight months of this year is 75,606.

EMPLOYMENT—Non-farm employment in mid-September was 45,864,000, a record high, according to Bureau of Labor Statistics. Previous record of 45,618,000 was set last December and the bureau expects further new records to be set this year as retail stores prepare for the Christmas season.



Index (chart above): Week ended Oct. 30 (preliminary) 177 Previous Week 179 Month Ago 175 Year Ago 168

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	99.0	98.5	96.0	96.5
Electric Power Distributed (million kilowatt hours)	5,550‡	5,539	5,449	5,009
Bituminous Coal Production (daily av.—1000 tons)	2,017	2,000	1,973	2,121
Petroleum Production (daily av.—1000 bbl.)	5,604	5,596	5,453	5,274
Construction Volume (ENR—Unit $1,000,000)	$179.1	$129.0	$128.1	$82.2
Automobile and Truck Output (Ward's—number units)	116,413	123,067	121,475	107,240

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons. ‡ Preliminary.

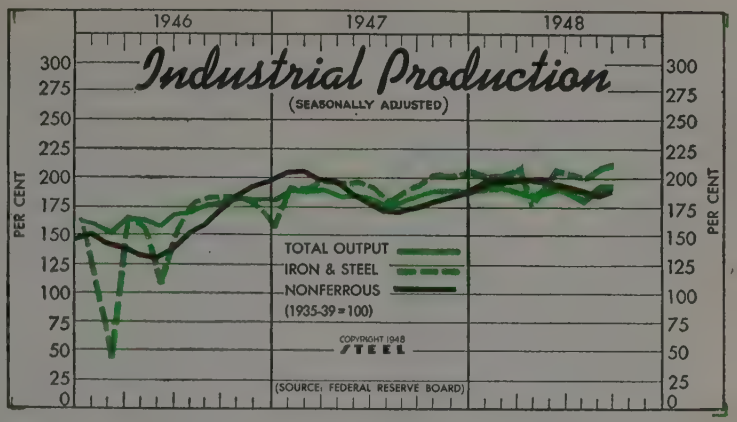
TRADE				
Freight Carloadings (unit—1000 cars)	904†	928	909	941
Business Failures (Dun & Bradstreet, number)	104	124	112	70
Money in Circulation (in millions of dollars)‡	$28,091	$28,157	$28,080	$28,519
Department Store Sales (change from like wk. a yr. ago)‡	+12%	+11%	+1%	+7%

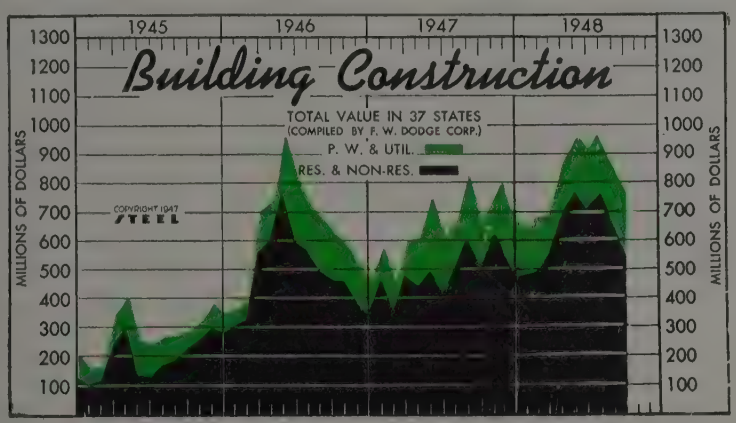
† Preliminary. ‡ Federal Reserve Board.

Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1948	1947	1948	1947	1948	1947
Jan.	193	189	203	192	197	203
Feb.	194	189	203	191	197	208
Mar.	192	190	207	196	200	202
Apr.	188	187	177	195	198	197
May	191	185	206	197	197	187
June	192	184	207	193	193	179
July	186	176	200	181	185	171
Aug.	191	182	207	188	186	170
Sept.	191	186	213	190	189	174
Oct.	...	...	190	...	204	...	179
Nov.	...	...	192	...	202	...	185
Dec.	...	...	192	...	205	...	189
Ave.	...	...	187	...	193	...	186





Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works Utilities		Residential and Non-residential	
	1948	1948	1947	1948	1947
Jan.	615.2	136.6	113.9	478.6	457.7
Feb.	682.0	177.3	90.5	504.6	351.6
Mar.	689.8	164.3	122.0	525.5	474.8
Apr.	873.9	184.7	161.4	689.2	441.0
May	970.8	205.0	252.9	765.8	490.0
June	935.2	215.7	185.7	719.5	419.4
July	962.7	217.9	165.9	744.8	494.4
Aug.	854.1	207.8	223.5	646.3	599.7
Sept.	762.2	202.7	141.5	557.5	508.4
Oct.	....	....	165.9	....	627.4
Nov.	....	....	181.5	....	533.6
Dec.	....	....	154.1	....	471.3
Totals	....	....	1,958.8	....	5,869.3

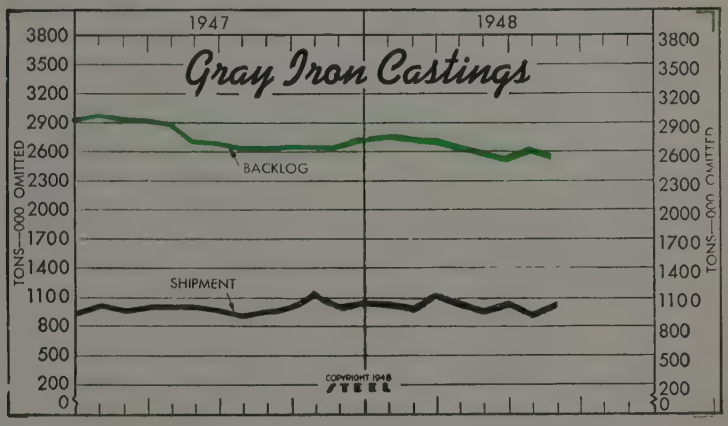
Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1948	1947	1948	1947
Jan.	1,064	1,078	2,803	3,021
Feb.	1,024	1,010	2,769	2,987
Mar.	1,169	1,090	2,726	2,979
Apr.	1,051	1,097	2,691	2,909
May	993	1,097	2,602	2,783
June	1,072	1,038	2,587	2,711
July	914	913	2,601	2,657
Aug.	1,051	952	2,599	2,631
Sept.	....	1,025	....	2,680
Oct.	....	1,154	....	2,669
Nov.	....	1,020	....	2,687
Dec.	....	1,066	....	2,782
Total	....	12,541		

* Unfilled orders for sale to the trade.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$14,374	$15,842	$14,020	$13,428
Federal Gross Debt (billions)	$252.3	$252.3	$252.3	$259.0
Bond Volume, NYSE (millions)	$21.3	$19.8	$17.7	$21.3
Stocks Sales, NYSE (thousands)	5,395	6,933	4,633	5,464
Loans and Investments (billions)†	$62.3	$62.1	$63.0	$65.0
United States Gov't. Obligations Held (millions)†	$33,416	$33,022	$33,921	$38,632

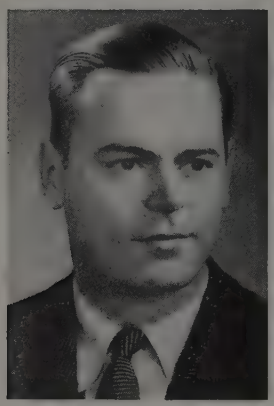
† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$95.05	$95.05	$95.05	$75.41
All Commodities†	165.3	164.8	168.7	158.0
Industrial Raw Materials†	178.2	177.2	182.4	177.0
Manufactured Products†	160.9	160.6	164.4	150.6

† Bureau of Labor Statistics Index, 1926 =100.

Men of Industry



J. K. ESLER JR.

ROBERT P. RUDY

WALTER O. MELOY

H. M. Harper Co., Morton Grove, Ill., manufacturer of nonferrous and stainless steel fastenings, announces the opening of a Detroit factory branch office located in the Curtis Bldg., 2842 West Grant Blvd., under the management of **J. K. Esler Jr.**, formerly associated with the Chicago headquarters of the company.

—o—

Frank B. Rackley has been made vice president in charge of sales by Jessop Steel Co., Washington, Pa. He formerly was general manager of sales, and before joining Jessop Steel Co. was in charge of stainless steel sales at the Chicago office of Carnegie-Illinois Steel Corp. **Curtis A. Gordon**, general works manager of Jessop Steel Co., has been made vice president in charge of operations. He formerly served as superintendent at the Colorado Fuel & Iron Corp., Wickwire Spencer Steel Division, at Buffalo.

—o—

Jones & Laughlin Steel Corp., Pittsburgh, announces several changes in its technical department for the extension of research and improvement of technical service. Three parallel and organizationally equal divisions of research have been created: Ore research has been set up as a separate research division under the supervision of **F. X. Tartaron**, manager of ore research. The Hazelwood laboratory group will carry on as the Division of Metallurgical Research under the supervision of **Dr. H. T. Clark**, manager of metallurgical research. The third research group is the Division of Coal & Coke Research under the supervision of **C. L. Potter**, manager of coal and coke research. Concurrently with these changes, **Dr. H. K. Work**, previously supervisor of metallurgical and ore research, will join the office of the director of technology as a staff assistant, with responsibility for research planning. **J. E. Morris**, formerly research engineer on a special development problem at Benson Mines, will become a member of the office of the director of technology as staff technologist to assist in the work of the general technical department.

—o—

Robert P. Rudy has been appointed district manager of the New York area for Market Forge Co., Everett, Mass. He has been a sales engineer of a New York mill supply house, selling materials handling and power transmission equipment. He previously had been assigned as staff assistant to contract and service and spare parts manager of Wright Aeronautical Corp., Paterson, N. J. In his new position with Market Forge Co. Mr. Rudy will be in charge of the Materials Handling Division.

—o—

J. F. Timmerman has been appointed district sales manager in charge of the Detroit office opened Nov. 1 by Portsmouth Steel Corp., Portsmouth, O. Mr. Timmerman was with Keystone Steel & Wire Co., Peoria, Ill., in a sales capacity for approximately nine years with the exception of two years spent in the U. S. Navy during the war. He joined Portsmouth Steel Corp. in January, 1948. The Detroit office is located in the Penobscot Bldg.

—o—

Three changes in executive assignments at International Harvester Co., Chicago, have been announced as follows: **Michael J. Graham**, formerly general manager, Farm Tractor Division, has been appointed director of manufacturing for the company, assuming the functions formerly performed by the late **Karl O. Schreiber**, vice president in charge of manufacturing. **Eugene F. Schneider**, formerly general manager, Refrigeration Division, has been appointed general manager, Farm Tractor Division, succeeding Mr. Graham. **Joseph E. Layton**, formerly manager of manufacturing, Refrigeration Division, has been appointed general manager, Refrigeration Division, succeeding Mr. Schneider.

—o—

Walter O. Meloy has been appointed manager of sales, Bar & Semi-finished Materials Division, Carnegie-Illinois Steel Corp., U. S. Steel Corp. subsidiary. He joined Illinois Steel Co. in 1924, and when Carnegie-Illinois Steel Corp. was formed in 1935, he was made assistant to manager of sales of the former division in the western area. In 1940 he transferred to Pittsburgh in the same capacity, and in 1945 was appointed assistant manager of sales, the position he held at the time of his present appointment.

—o—

Saginaw Sheet Metal Parts Corp., Saginaw, Mich., announces election of **Charles A. McLeod** as president and general manager, succeeding the late **Charles V. Hale**. Mr. McLeod, one of the founders of this corporation, has been secretary and treasurer since 1930. **Otto E. Schroeder** retains his office as vice president of the corporation, and superintendent of the plant. **R. C. Somerfeld** was elected secretary and **Charles V. Mc-**

IT'S HARPER

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FOR USING HARPER EVERLASTING FASTENINGS

1 RESISTANCE TO RUST AND CORROSION
2 RESISTANCE TO HIGH TEMPERATURES
3 NON-MAGNETIC
4 NON-SPARKING
5 RE-USEABLE
6 ATTRACTIVE APPEARANCE
7 EASY TO CLEAN
8 HIGH STRENGTH
9 LONG LIFE
10 LOWER ULTIMATE COST
11 RESISTANCE TO FATIGUE

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PROMPT SHIPMENT FROM STOCK . . . Harper maintains stocks of over 5,000 individual items in Chicago and New York . . . large quantities of each. Others being added constantly. Specials made to order from ample stocks of raw materials.

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NEW YORK 13 • 200 HUDSON STREET

BRANCH OFFICES: Atlanta, Cambridge, Cincinnati, Cleveland, Dallas, Denver, Detroit, Grand Rapids, Los Angeles, Milwaukee, Philadelphia, St. Louis, San Francisco, Seattle, Toronto (Canada)

Leod Jr. was chosen as treasurer.

—o—

Edmund T. Flanagan, manager of the New York Sales Division, Fairbanks Co., New York, has been appointed manager of regional sales in addition to his present position.

—o—

Louis W. Kroner, owner and manager, Easton Sanitary Milk Co., Easton, Pa., has been named to the board of directors, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

—o—

R. M. Hoel, sales agent for American Car & Foundry Co., New York, has been transferred from the Pittsburgh to the New York district office, from where he will represent the company in the northeastern railroad area. He has been in the sales department since 1946.

—o—

At the quarterly meeting held in October, the board of directors of Inland Steel Co., Chicago, announced that **Wilfred Sykes'** term of office as president has been extended beyond his normal retirement date of Dec. 31, 1948, until the annual meeting of the board on Apr. 27, 1949, and that a program was approved of continuing Mr. Sykes' services thereafter in such capacity and for such period of time as the directors may subsequently determine. Simultaneously it was announced that **Clarence B. Randall,** formerly vice president in charge of raw materials, has been elected assistant to the president; **P. D. Block Jr.,** assistant vice president, succeeds Mr. Randall as vice president in charge of raw materials; and **H. W. Johnson,** staff assistant to the president, has been made vice president in charge of steel manufacturing.

—o—

Tudor A. Wall has joined Kaiser & Co. Inc., Richmond, Calif., as administrative assistant to **J. L. Ashby,** vice president and general manager.

—o—

Hugh A. Dewar has been appointed Pacific Coast sales manager of the Pole Line Hardware Division of Oliver Iron & Steel Corp., Pittsburgh. He formerly was district sales manager, with headquarters in Los Angeles.

—o—

Election of **George N. Lilygren** as a vice president of Carrier Corp., Syracuse, N. Y., has been announced by the company. Mr. Lilygren was appointed comptroller in June, 1947, and will now serve as vice president and comptroller. He formerly was assistant comptroller of Briggs Mfg. Co., Detroit.

—o—

Due to the illness of **J. W. Congdon,** superintendent at the plant of Johnson & Bassett Inc., Worcester, Mass., the following appointments have been announced: **Jefferson E. Williams** has been made factory manager, and **Leon C. Cloutier,** superintendent. All factory operations are now under the supervision of the factory manager.

—o—

J. J. Bourgoine, vice president and director, Shaw-Walker Co., Muskegon, Mich., has been promoted to the position of director of all retail sales, succeeding the late **T. E. Miller** in that position. Mr. Bourgoine will continue to supervise the company's New York activities in the Chrsyler Bldg., which duties he has performed for the past 23 years. Assisting Mr. Bourgoine as director of branches outside New York will be **A. R. Hedeman,** who, for the past 13 years, has been in charge of the company's Boston activities.

—o—

Gwilym A. Price, president, Westinghouse Electric Corp., and a member of the board of directors of Baldwin Locomotive Works, Philadelphia, has been elected a member of the executive committee of Baldwin.

—o—

Fred W. Bennett, manager, Youngstown Chamber of Commerce Traffic Bureau, will be general traffic manager of Sharon Steel Corp., Sharon, Pa., effective Nov. 15. He will succeed **Michael F. Dougherty,** who has been named special traffic representative.

—o—

Gilbert W. Chapman, vice president in charge of finance, Yale & Towne Mfg. Co., New York, has been elected a member of the board of directors of the company.

—o—

James R. Longwell, for the past four years director of engineering and research, Carboloy Co. Inc., Detroit, has been named assistant to the president, and **F. C. Ritner** has been appointed vice president in charge of engineering and research. Mr. Ritner joined the company in 1929 and has been active not only in engineering but also in sales, service and industrial relations capacities. He was named vice president this year. Mr. Longwell joined Carboloy Co. 19 years ago, and has served in various executive positions.

—o—

Lyman Thunfors has been appointed vice president and general manager, Paul M. Wiener Foundry Co., Muskegon, Mich. **William G. Grant,** former vice president and general manager, who has been ill for the past year, will continue to serve the company in an advisory capacity. Mr. Thunfors, for the past four years, has been affiliated with Richmond Radiator Co., Uniontown, Pa. He was vice president in charge of manufacture at this Reynolds Metals Co. subsidiary.

—o—

Lin C. Cook, former Goodyear Tire

C. B. RANDALL

P. D. BLOCK Jr.

H. W. JOHNSON

& Rubber Co., Akron, executive, has been appointed chief industrial engineer for Willys-Overland Motors Inc., Toledo, O.

—o—

Warren Bicknell Jr., president, Cleveland Construction Co., has been elected to the board of directors, M. A. Hanna Co., Cleveland, succeeding **Richard F. Grant,** resigned. Mr. Grant had previously been a member of the partnership of M. A. Hanna Co. and was vice president from 1922 to 1928.

—o—

George P. Paine has been appointed director of promotion, American Standards Association, New York.

—o—

Victor E. Martin and **Roger Birdsell** have been elected vice presidents of Yates-American Machine Co., Beloit, Wis. Mr. Martin is in charge of the Woodworking Division sales of the company, and Mr. Birdsell is in charge of sales, Radiator Division.

—o—

Charles E. Campbell has joined the sales force of Hanson-Van Winkle-Munning Co., Matawan, N. J. He will make his headquarters at Detroit.

—o—

Paul R. Maxey has been appointed division engineer, and **Alva E. Oakley,** mine superintendent of No. 1, 2, 4 and 5 mines at Montcoal, for the Mining Division of Armco Steel Corp., Middletown, O.

—o—

Northern California Chapter, Institute of Scrap Iron & Steel Inc., has re-elected **Paul Learner,** Learner Co., Alameda, Calif., as president, and Frank Malley, Associated Iron & Metal Co., Oakland, Calif., as vice president. **David G. Robbins** was elected secretary-treasurer.

—o—

Charles B. Cleevely, foreman of crane repairs, has been appointed assistant superintendent of maintenance, Campbell Works, Youngstown Sheet & Tube Co., Youngstown, O. He succeeds **August C. Jacob,** who retired recently.

—o—

C. R. Kammerer has resigned as executive vice president, Hercules Steel Products Corp., Galion, O., with which he has been connected in an executive capacity since 1945.

—o—

William A. Hayes has been appointed section manager in the electronic tube sales department, Westinghouse Electric Corp., Pittsburgh. For the past four years Mr. Hayes has been electronic tube specialist for Westinghouse in the Middle Atlantic, New England and Eastern districts, with headquarters in New York. Previously he was a tube design engineer and supervisor of the tube development laboratory in Bloomfield, N. J.

—o—

A. D. Plamondon Jr., president, Indiana Steel Products Co., Chicago, has been appointed to the Munitions Board, Electronics Equipment Industry Advisory Committee.

—o—

Black & Decker Mfg. Co., Towson, Md., announces that **R. A. Wernsdorfer,** service engineer in charge of its repair and service of electric tools at the Atlanta branch, has been transferred in the same capacity to the Baltimore branch. **G. C. Wilhide Jr.** has been appointed to succeed Mr. Wernsdorfer at Atlanta.

—o—

George Rubine, Hudson Iron & Metal Co., Bayonne, N. J., has been elected president, New Jersey Chapter, Institute of Scrap Iron & Steel Inc. He succeeds **Emanuel J. Moskowitz,** Schiavone-Bonomo Corp., Jersey City, who was made chairman of the executive committee. Other officers elected are: **Paul Giordano,** Giordana Waste Material Co., Trenton, N. J., first vice president; **Irving Bussel,** Plainfield Iron & Metal Co., Plainfield, N. J., second vice president; **Julius Brauer,** Summit Metals Co., Jersey City, third vice president; **Eli Bussel,** Plainfield Iron & Metal Co., treasurer; and **Murray Kunin,** Schiavone-Bonomo Corp., secretary.

—o—

Charles C. Whittelsey has been elected vice president in charge of construction activities of Ford, Bacon & Davis, engineers-constructors, Chicago. He has been with the company for the past 23 years, and was elected executive vice president of the firm's subsidiary, Ford, Bacon & Davis Construction Corp., with headquarters in Monroe, La.

—o—

Franklin Thomas, professor of civil engineering and dean of students at California Institute of Technology, Pasadena, Calif., was nominated as the 1949 president of American Society of Civil Engineers.

—o—

G. L. Holt has been appointed assistant district manager of the Madison, Ill., plant of American Car & Foundry Co. From 1944 until joining ACF he was plant manager of International Railway Car & Equipment Mfg. Co., Kenton, O.

—o—

John M. Jaycox has been appointed chief engineer of the Gary Works, Gary, Ind., of National Tube Co., U. S. Steel Corp. subsidiary. He formerly was consulting engineer on blooming mill construction at the company's Lorain, O., Works.

—o—

Cornelius A. Johnson, metallographer at Armour Research Foundation of Illinois Institute of Technology, won two first places and one honorable mention in the photography competition at the National Metals Congress meeting in Philadelphia recently.

—o—

Raymond C. Cosgrove has been elected president of Nashville Corp., a subsidiary of Avco Mfg. Co., New York, and will supervise operations of Avco's Lycoming and Spencer Heater Divisions. Mr. Cosgrove also was elected to the boards of Nashville Corp. and ACF-Brill Motors Co.

—o—

Joseph F. Collins, safety supervisor for the eastern district, Youngstown Sheet & Tube Co., Youngstown, has been elected chairman of the metals section, National Safety Council, succeeding **Frank Kelsey,** Jones & Laughlin Steel Corp., Pittsburgh.

—o—

William F. Smith, former engineering director of the Manhattan Project, war-time research unit of Carbide & Carbon Chemicals Corp., has joined the United States Testing Co. Inc., Hoboken, N. J., to organize a new engineering inspection service in conjunction with building and building material.

—o—

George G. Montgomery has been elected a member of the board of directors, General Electric Co., Schenectady, N. Y.

—o—

Detroit Chapter, American Foundrymen's Society, has set up a three-man educational committee, headed by **Jess Toth,** secretary, Harry W. Dietert Co. Other members are **L. Carl Beers** and **A. S. Lundy,** both affiliated with Claude B. Schneible Co.

—o—

Floyd C. Gustafson has been appointed general sales manager at the Linden, N. J., branch of Pacific Airmotive Corp.

—o—

Ernest J. Platfoot has been named eastern regional manager, Packard Motor Car Co.

—o—

Edward J. Bock, superintendent of maintenance at the Monsanto, Tenn., plant of Monsanto Chemical Co., has been made manager of that plant.

—o—

Paul G. Mattern has been appointed manager of claims, Bethlehem Pa-

EDSON W. FORKER

Named president, Chemical Plants Division, Blaw-Knox Construction Co., Pittsburgh. Noted in STEEL, Nov. 1 issue, p. 70

LEE MULLEN

Elected vice president in charge of sales, Globe Steel Tubes Co., Milwaukee. Noted in STEEL, Nov. 1 issue, p. 75

W. T. GETTIG

Who has been appointed works manager, Edward Valves Inc., East Chicago, Ind. Noted in STEEL, Nov. 1 issue, p. 75

cific Coast Steel Corp., San Francisco, succeeding **Theodore Herman,** who has been transferred to the operating department at the company's Los Angeles plant.

—o—

J. S. Thomas has been appointed director of purchases, and **Charles Beck,** manager of raw materials supply, Armco Steel Corp., Middletown, O. Mr. Thomas succeeds the late **Newman Ebersole.** Mr. Thomas joined the organization in 1927 and since July has been assistant director of purchases. Mr. Beck has been serving as assistant general superintendent of the Middletown Division. The position of manager of raw materials supply has just been established at Armco.

—o—

Frank E. Houck, formerly Cleveland district sales manager, has been appointed manager of sales, Steel Strapping Division. **Charles E. Nail,** associated with sales for the past three years, has been appointed manager of sales, Electric Welded Tubing Division. **Gordon E. Tomb** of the Building Productions Division has been appointed manager of sales, Tel-O-Post Division.

—o—

Carl H. Kindl has joined the staff of General Motors Corp., Detroit, as assistant to **O. E. Hunt,** executive vice president. He formerly was with Delco-Remy and Delco Products Divisions of General Motors.

—o—

R. A. Emmett, president, Detrex Corp., Detroit, has announced the appointment of **Garrett C. Van de Riet** as controller.

—o—

Bert D. Lynn has been appointed editorial representative for STEEL in southern California, with headquarters at Los Angeles. Mr. Lynn, a graduate of Western Reserve University, served as an assistant editor and conducted the aviation department of STEEL in 1938-39. In 1940 he joined Douglas Aircraft Co. and served as executive assistant to the director of public relations until 1947, except for several years' service in the Air Forces. For the past year, he has been specializing in industrial engineering, industrial relations, advertising and merchandising services for small and medium-size companies.

—o—

William W. Acuff has been appointed regional manager for the eastern region, Building Products Division of Reynolds Metals Co., Louisville. His office is in New York. Before joining Reynolds, Mr. Acuff was president of Robert Hetherington & Son, Sharon Hill, Pa.

—o—

Nicholson File Co., Providence, R. I., announces the appointment of **J. Clifford Berthiaume** as district manager of the central western territory.

—o—

L. Douglas Lacy has been placed in charge of a new sales office recently established in Chicago by the H. K. Ferguson Co., Cleveland.

OBITUARIES . . .

Henry V. Blaxter, 66, chairman of the board, Mackintosh-Hemphill Co., and director of Oliver Iron & Steel Corp. and Universal Cyclops Steel Corp., died Oct. 30 in Pittsburgh.

—o—

L. H. Burnett, 74, former vice president of Carnegie-Illinois Steel Corp., died Oct. 26 at Long Branch, N. J. Mr. Burnett had retired from Carnegie-Illinois in 1941.

—o—

John J. Kauffmann, 59, secretary-treasurer, American Rivet Mfg. Co., Cleveland, died Oct. 30. He was secretary-treasurer for Guide Motor Lamp Co., Cleveland, for 22 years, and when the company was sold to General Motors he accompanied the office staff to Anderson, Ind. A few years later he returned to Cleveland to join the American Rivet Mfg. Co.

—o—

Malcolm M. Parker, 45, assistant to the purchasing agent of Lukens Steel Co., Coatesville, Pa., died recently of a heart attack.

—o—

Harry J. Hassler, civil engineer for Arthur G. McKee Co., Cleveland, died recently after an illness of six months.

—o—

Herbert M. Steele, 74, for the past 26 years affiliated with National Steel Corp., Pittsburgh, died Oct. 26. Some time ago he relinquished the position of vice president of the company. He had been connected during his business career with several large steel companies, including U. S. Steel Corp. and Trumbull Steel Co.

—o—

Thomas K. O'Connor, 61, vice president and treasurer, Haarmann Structural Steel Co., Holyoke, Mass., died Oct. 26.

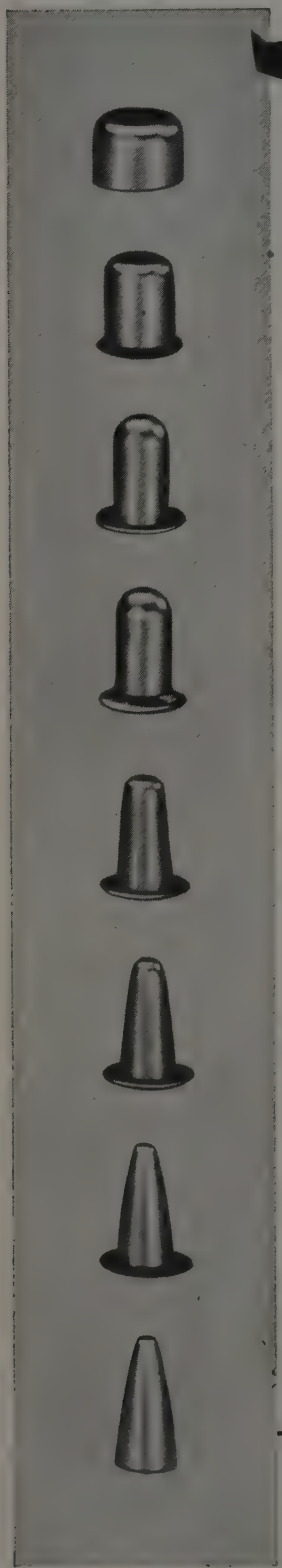
—o—

Edward W. Donahoe, 83, formerly associated with American Steel & Wire Co., died in California Oct. 28.

—o—

Arthur F. Riggs, 70, retired district engineer, Chicago, for General Electric Co., died Oct. 27.

Blanking...Cupping...or Drawing



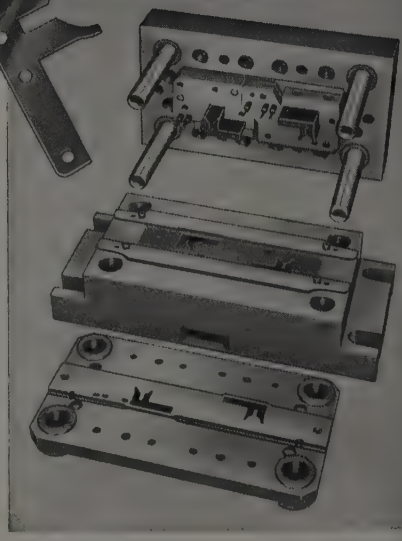
SIMPLE...

● In this simple seven-draw operation, 600,000 Inconel pencil points were drawn before polishing the Carboloy dies.

In a second run, using stainless steel (18-8) .010 thick, 125,000 points have been drawn to date with no measurable effect on the Carboloy dies.

Two factors were responsible for the use of Carboloy in this operation: *no scratches could be tolerated* on the finished points, and a long run without polishing of the dies was desired.

OR COMPLEX



2,200,000 strokes were made on this die for blanking electric motor laminations, *on the first sharpening*. Steel dies averaged only 100,000 on each sharpening.

Whether you need simple Carboloy dies that you can make in your own shop or purchase from Carboloy, or complex dies like this Carboloy motor-lamination die available through many professional die shops, you will find that Carboloy gives you longer runs, better finishes, closer tolerances and lower costs.

A Carboloy engineer will gladly call on you at any time to help you with any problem. Send for the Carboloy DIE ENGINEERING MANUAL, D-124, to find out more about the advantages Carboloy Cemented Carbide can give you. Carboloy Company, Inc., 11141 E. 8 Mile Road, Detroit 32, Mich.

SPECIFY **FOR *ANY* KIND OF DIE WORK**

CARBOLOY®

CEMENTED CARBIDE

Engineering News . . . AT A GLANCE

HELPFUL BENDS— One-piece bends now being incorporated in pipes used by M. W. Kellogg Co., Jersey City, N. J., in building catalytic-cracking plants are reported to minimize erosion, allow uniform flow of fluids and double construction flexibility. Process used in shaping pipe with perfect contours is capable of making bends in diameters up to 100 inches, although 60-inch bends are the maximum required for the catalyst carrier lines. Largest commercial one-piece bends ever made previously were only 34 inches in diameter. Bends larger than this necessitated welding of five or six angular sections together.

FAST "TOOTH TREATMENT"—Electronic method of selective hardening the teeth of 55-tooth wheel sprockets in the plant of Harley-Davidson Motor Co., Milwaukee, not only is jumping sprocket production some 50 per cent, but also is providing a much improved product. Equipment involved —supplied by Induction Heating Corp., New York—consists of an induction generator and a 2-position work table equipped with special jigs and fixtures for automatic operation. Formerly, the sprocket was heated in its entirety. Present method of hardening the teeth only is reported to reduce considerably the possibility of distortion. Equipment also is flexible enough to handle other parts—idler gears, crank pins and clutch hubs, for example.

TESTS 5-INCH SOLIDS— In the field of fatigue testing, Baldwin Locomotive Works, Philadelphia, reports it is now in the process of building a 1,200,000-inch pound capacity cantilever type rotating beam machine capable of taking solid specimens of about 5 inches in diameter to a stress of 100,000 pounds per square inch. It also handles tubing up to 8½ inches in diameter.

HEFTY ALLOY—The new alloy, Hevimet—developed by the metallurgy division, chemical department, General Electric Co.—orginally introduced as a screen against rays from radium or x-ray machines, now is being adapted to a variety of industrial uses, it is learned. Possessing a density 50 per cent greater than that of lead, the metal is found to be useful as a balance weight in eliminating vibration in crankshafts, centrifugal clutches and other rotating parts. Composed of about 90 per cent tungsten, 6 per cent nickel and 4 per cent copper, it is produced by powder metallurgy and is machinable.

TRANSDUCER WITH POSSIBILITIES— Numerous industrial applications, among them strain gages, pressure elements, electric weighing devices and automatic temperature controls, may follow perfection of a variable-resistance spring transducer, developed by W. A. Wildhack and his associates at the National Bureau of Standards, Washington. The device —which takes form of a Wheatstone bridge each arm of which is a helical spring wound in such a way that the turns separate one by one rather than simultaneously—converts very small displacements into large electrical changes. As a spring is slightly stretched, its resistance is greatly increased. Longitudinal displacement of a rod which bisects the apparatus is produced by addition of small weights. This elongates one pair of springs and shortens the other pair. Resultant unbalance, indicated by a galvanometer, provides a measure of the displacement occurring.

"MERRY-GO-ROUND" CLEANING—Fasteners processed through the plant of Tinnerman Products Co., Cleveland, are cleaned in a matter of 14 minutes from the time they enter a machine referred to as the "merry-go-round" until discharged into tote boxes. The machine which consists of five rotating baskets moving in a circle on a flat plane, passes the fasteners through five distinct stations during the cleaning cycle loading and unloading, wash, rinse and drying. Time required at each station is about 2¾ minutes. Setup is reported to be economical as well as efficient. (p. 90)

WRONG DRAFT WEARS DIES—Smaller draft angles on forgings tend to increase die wear. This tends to reduce life of the die impressions and usually increases difficulty in maintaining forging sizes within normal commercial forging tolerances. Average or normal draft angle, it is pointed out, is 7 degrees on all sides for outside draft. Inside draft, which is needed for pockets in the drop forgings and for holes, is normally 10 degrees. On forgings where die impressions are deep and difficult, it may be necessary to increase draft angles on the outside to 10 degrees and draft on the inside walls to 15 degrees. (p. 96)

INCREASES DRAWING SPEED—Besides reducing damage to dies and wire, a compound currently used in connection with wire drawing in J & L's Aliquippa, Pa., plant, also protects the wire against rusting while increasing the drawing speed by some 25 per cent. Because film deposited on the wire is not water-soluble, and assures a degree of lubrication for the wire in subsequent drawing, amount of lime picked up to carry lubricant is not critical as in conventional practice. (p. 102)

INVESTIGATION A MUST—In selecting the proper lubricant for open gears such factors as speed, temperatures and methods of application are important factors to be considered by those responsible for efficient lubrication and maintenance of the equipment. Joseph A. Rigby of Brooks Oil Co., points out that technical or chemical data need not be a salient or necessary consideration as actual accomplishments can only be determined by trial and use. (p. 106).

Engineering and Production Ingenuity Behind the

Creation of a Fastener

By DAN REEBEL
Associate Editor, STEEL
Photography by the author

Fig. 1—Group of new type door-lock cylinder retainers

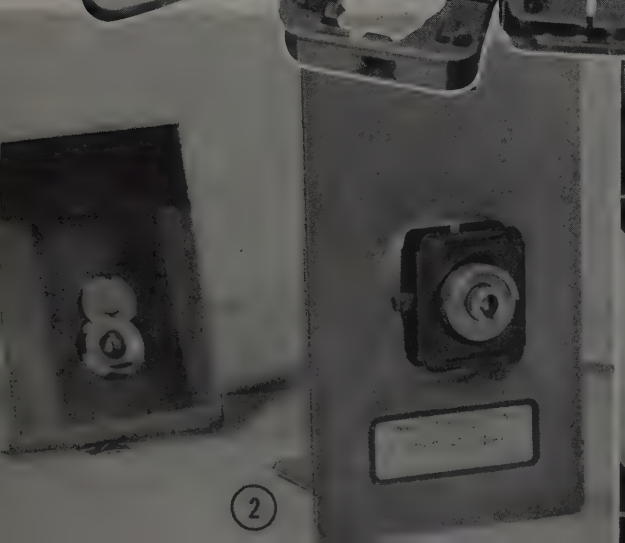


Fig. 2—Front and back view of automobile panel showing fastener which secures barrel lock. Operating side of lock is shown in mirror

Fig. 3—Engineering committee composed of director of engineering, product and design engineers study the proposed fastener from all angles to decide feasibility of production and subsequent end use operation

Although this finished part is simple in appearance, factors involved in its design and production are numerous and detailed. Hours of conference between engineers, die makers, production men and the customer are necessary to produce a modern, competitive fastener which will effect assembly line savings

ELIMINATION of a simple joining operation plus the realization of substantial savings in assembly labor costs are being experienced by a prominent automotive manufacturer through use of a new type door-lock cylinder retainer currently produced by Tinnerman Products Inc., Cleveland. The new fastening unit replaces a door lock cylinder retainer assembly which formerly consisted of two parts —a lock cylinder retainer and a locking screw retainer. The device is interesting not only because it is helping step up production at the user's plant, but because it involved a great amount of engineering and production ingenuity in its creation.

The old lock cylinder retainer was a deep drawn stamping cylindrical in shape with a flange formed on one end. This flange was used for welding the piece to the door panel re-enforcement for the lock. The locking screw retainer was a screw machine part which was welded to the lock cylinder retainer. With the new part only one is necessary. Elimination of welding is made possible by the use of four special patented latching devices known as the "heel and toe" method of retention.

Cuts Cost of Servicing—A major feature of this device is the fact that the part is easily replaced if necessary, thus cutting cost of service in the field and at dealer's and service garages. Serviceability and ease of replacement in the field were some of the many considerations which prompted its design and production.

In developments such as this, the customer usually requests from a district sales engineer, information as to the possibility of such a fastening device being produced. He in turn gives a general description and preliminary sketch to his organization's director of engineering who together with the product and design engineers, the three comprising the engineering committee, analyze the request from the following viewpoints.

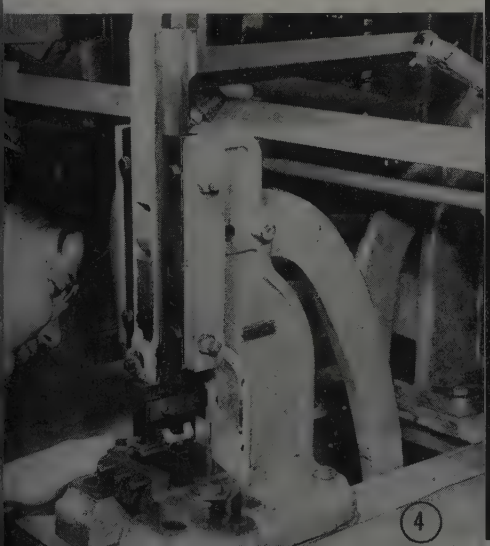
1. Is there enough quantity involved to warrant an investigation of production possibilities.
2. An attempt is made to arrive at a design that will be feasible to produce.
3. The part is analyzed to see if it can be produced competitively.
4. Methods necessary for assembly in the customer's plant are studied.
5. A decision is made as to whether or not the part will function satisfactorily after assembly by the customer.

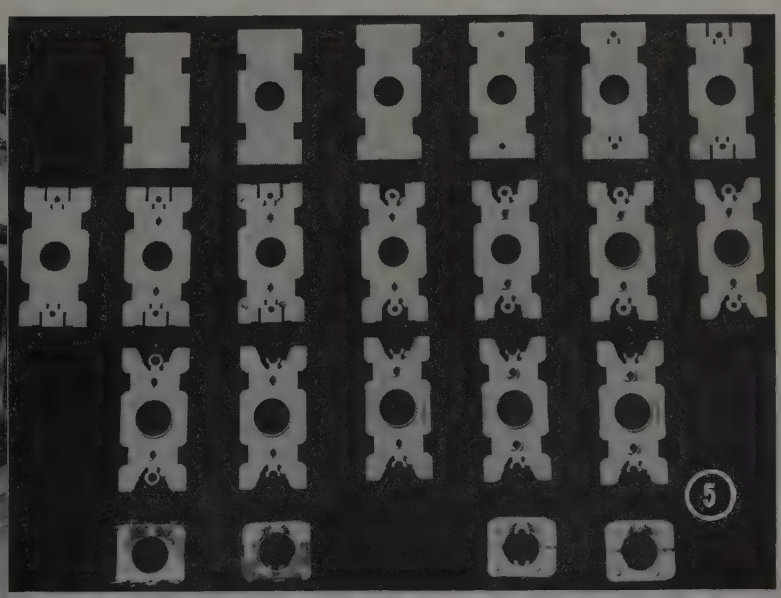
Sample Order Processed—An experimental sample order is created which includes a sketch of the design considered, type and gage of steel required, number of units to be made, shop equipment necessary to produce the fastener, and all other information required for proper handling of the project throughout the organization. It is then placed in the schedule for experimental engineering purposes after which an experimental sample order is given to one of the many development engineers who subsequently sets up the various operations step by step on kick foot presses. Two hundred and seventy-five of these presses are located in the experimental laboratory and each engineer is assigned a certain group for setting-up the various operations of the particular job he is developing. Each experimental operation of the door lock cylinder retainer is shown in Fig. 5.

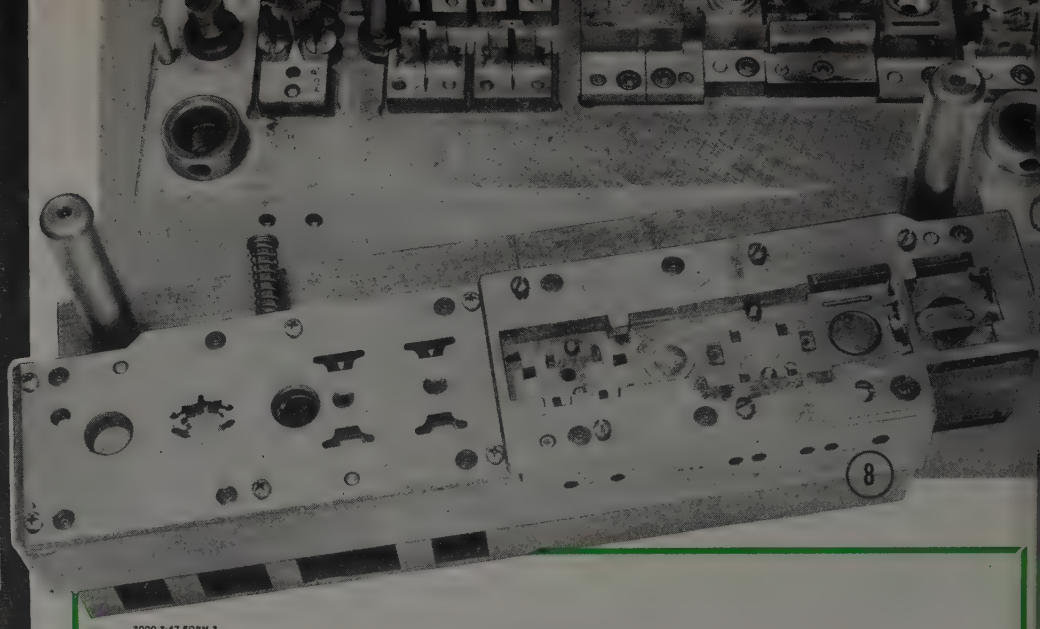
Combinations of these various operations may be

Fig. 4—Development engineer is setting up one of the separate operations on a foot press. Each operation is left intact on the press until entire sequence has been worked out

Fig. 5—Samples mounted on board show the entire sequence of foot press operations as set up experimentally. Several of these may be combined into one station of the finished progressive die







2000 2-47 FORM 2

Speed Nut System (PATENTED)

CODE NO. 15-300-865

EXPERIMENTAL SAMPLE ORDER Nº 8749

TINNERMAN PRODUCTS, INC. DATE 9-13-46

CUSTOMER AUTOMOTIVE COMPANIES CUST. PART NO.

ADDRESS DETROIT, MICH. OUR PART NO. C 7575-1032-4

INDIVIDUAL SAMPLES TO DETROIT OFFICE

PROMISED QUANTITY 50 EXTRA FOR WB 500

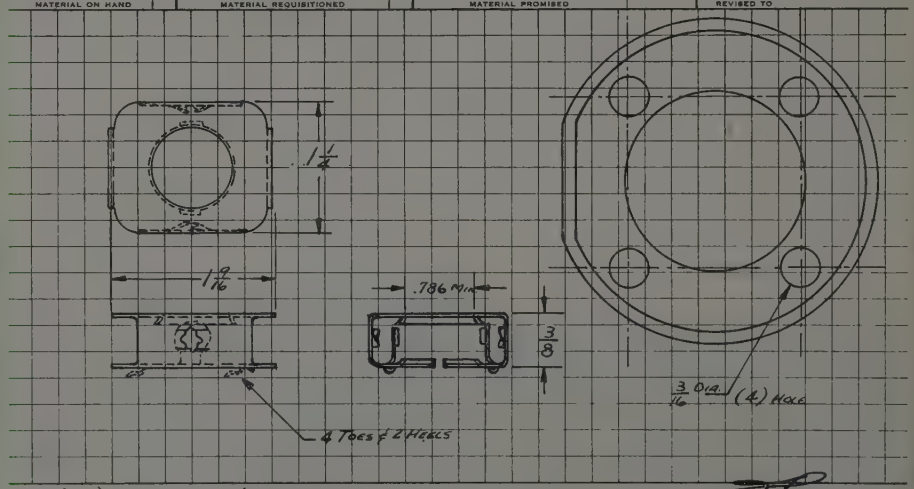
MATERIAL SAE 1060 STEEL THICKNESS .022 SCREW OR STUD 10-32 MACHINE SCREW

TYPE MACHINE FOR PRODUCTION 4 SLIDE 5-3-F

DEMONSTRATION UNIT OR SAMPLE LOCK ASSEMBLY

SPECIAL INSTRUCTIONS

MATERIAL ON HAND	MATERIAL REQUISITIONED	MATERIAL PROMISED	REVISED TO



FINISH (-4) PARKERIZE & WAX ORIGINATOR

ASSEMBLY UNITS REQUIRED	4
ASSEMBLY TOOLS REQUIRED	0

REVISION	DESCRIPTION

BLANK 1 3/16 X .020 X 3 1/16 MATERIAL TYPE SAE 1060 STEEL HOURS LABOR

SAMPLES COMPLETED 10-26-46 BY SEITZ

APPROVED BY ENGRS COMMITTEE

SAMPLES SHIPPED TO DETROIT OFFICE

VIA FIRST CLASS MAIL

BY F. BRICKMAN DATE 10-26-46

Nº 8749 (9)

Fig. 6—Test strip as removed from dies. Shearing and forming of finished unit is next step in process

Fig. 7 and 8—Progressive dies used to produce the finished formed fastener

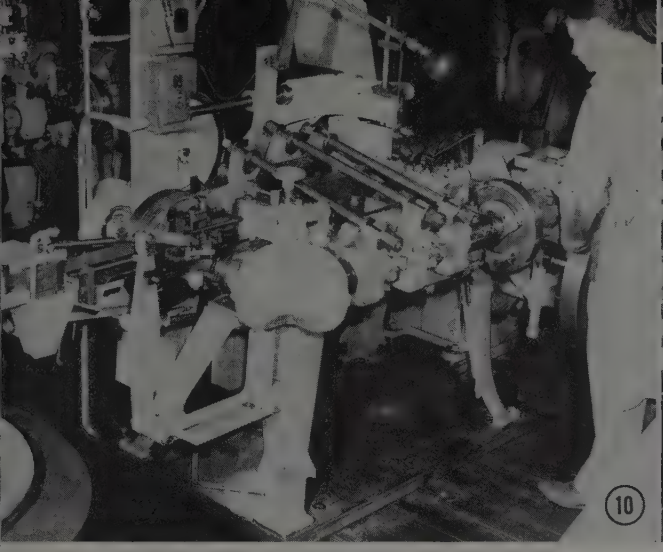


Fig. 9—Experimental sample order that is prepared by the engineering department and used by development engineer for setting up the various forming operations on the kick foot presses

Fig. 10—Nilson S3F four-slide machine which produces approximately 5000 finished units hourly. Strip supply shown on flat reel at left

Fig. 11—Close-up view of Nilson machine showing partially processed strip about to contact forming dies. Note arrow

consolidated into one station on the progressive die by the die maker. During this work, the engineer consults with the superintendent of tool design and estimating who controls die design and is constantly working toward simplification of all tools used within the plant. His approval as to whether or not the tool may be produced is final. Due to all this engineering consultation and experimentation, the customer reaps the benefit of the cheapest parts that can be produced by the most inexpensive and simplest methods known. When making the finished pilot samples on the foot presses, usually 200 pieces are formed, 25 per cent of which are given to the customer, the remaining 75 per cent being retained by the company. This is done in order to avoid having to set up presses a second time, to have additional samples available if the customer requests more, and in case the same sample is ever needed to submit to another customer.

Final Approval Signals Production — After being approved by the superintendent of tool design, samples are submitted to the customer for his approval. Any minor revisions suggested or desired by the customer demand that the above steps must again be performed to see if the changes can be made consistent with good engineering and production principles. After customer's final approval, nothing is done until a purchase order is received. At that time the engineering department writes a tool authorization and releases the part for production.

From the information supplied by the engineering department, the superintendent of tool design is now ready to crystallize his idea of how the progressive dies should be laid out and produced. He first draws this on paper, constantly making minor changes until satisfied, after which the progressive dies are made. Perhaps further slight design changes not affecting the part's function would enable the product to be produced on more simplified dies and tools which would result in better production, lower maintenance, with the resultant lowering of the part's cost to both producer and the customer. If such is the case, the die maker sends his suggestions to the design department for their approval. In making the dies wherever expedient, carbides are used for die sections when the nature of that operation demands an extremely hard material. It may well be that not all stations on the progressive die will be made of the same tool steel or carbide material.

Samples Checked Closely—The tool maker fits the die and form tools into a Nilson S3F four-slide machine and runs off a series of samples which are closely checked by the inspection and test laboratory. If the laboratory grants its approval, tools are then removed from the machine and hardened by the most beneficial heat treatment known for the particular type die materials used. Samples are again run on the machine and checked and approved in the test laboratory, after which gages are produced for subsequent checking of the finished fasteners. The tool maker makes a pilot run through the machine and if everything is working correctly, the production department then takes over. This type of machine produces on an average of 5000 completed pieces per hour.

Automatic stock lubrication is utilized which imparts a thin film of oil to both sides of the strip, a wiper being used to remove all excess oil before the strip enters the dies. Strip steel of SAE 1060 analysis is bought in widths of 6 to 6½ inches and slit to 1-7/16 inch widths for the production of this piece. This effects quite a saving as smaller widths of strip are more expensive than the larger widths. During the production run, parts are being checked constantly by the operator and the floor inspector spot checks production of each machine approximately once an hour.

On emerging from the machine, completed fasteners drop into tote boxes which are located underneath the machine. Each box receives a final spot check by the floor inspector before it is permitted to leave the machine. Material is then routed to the

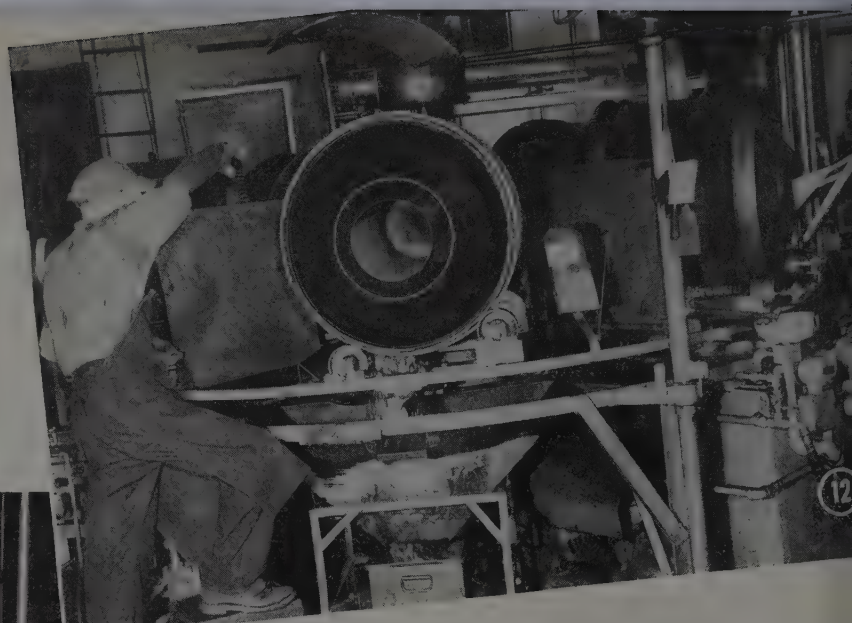


Fig. 12 — "Merry-go-round" washing unit designed by A. H. Tinnerman. Pausing 2¾ minutes at each station the complete cycle requires approximately 14 minutes. This unit offers the company a financial advantage over other types of drying equipment

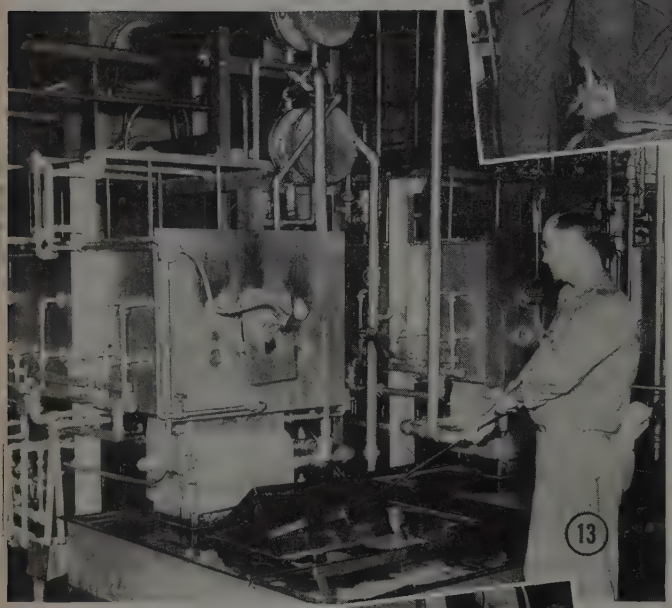


Fig. 13—Operator is shown removing a wire mesh basket of fasteners which have been oil quenched after moving through an American Gas Co. continuous shaker type furnace. A reciprocating floor constantly jiggles the parts toward the discharge end of the unit. Heat treatment takes 2½ to 3 minutes at a temperature of 1575 degrees F

Fig. 14—Koch drying and baking ovens are used for final finishing of parts which are held at 250 to 300 degrees F for 15 to 20 minutes

scales where parts are weight counted. Each machine also carries a computor which shows a running tally of the machine's production and is used as a cross check to the weighing count.

Tote Boxes Tagged—At this point a routing ticket is made out and applied to each tote box after which it goes on through the normal sequence of cleaning, heat treating, cleaning, drawing, finished, packaging and shipping. During the final check and test, the piece is scrutinized for: 1, dimensions; 2, distortion; 3, hardness; and 4, finish.

Cleaning of the fasteners is performed in a machine referred to as the "merry-go-round," developed by A. H. Tinnerman, president and chairman of the board. It consists of five rotating baskets moving in a circle on a flat plane which passes through five distinct stations during the cleaning cycle. The first is a loading and unloading; second, a wash; third, a rinse; fourth and fifth; drying. It takes approximately 2¾ minutes at each station to complete the cycle, requiring approximately 14 minutes from the time the fastener enters the machine until it is cleaned and ejected into the tote box. This setup replaces a trichlorethylene type heated bath into which parts were submerged and then brought up through the vapor to a final drying. In addition to offering a financial advantage, the process is also less dependent upon the human element. All the operator does is load the machine, then open the hatch on the baskets at the end of the cycle and let the material fall into the waiting tote boxes.

Parts Heat Treated—American Gas Co. continuous shaker-type furnaces are used for heat treatment. Parts enter one end of the (*Please turn to Page* 124)

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

WITH THE GEARMAKERS: As has been the case about this time of year for the past ten years, I have just had the privilege of sitting in with the top-flight engineers and industrialists who make up the membership of the American Gear Manufacturers Association.

This semiannual meeting at Edgewater Beach Hotel, Chicago, as has been true of every AGMA meeting which I have attended, represented a blending of engineering, production and managerial discussions which I believe would be a good pattern for many another association in the metalworking industry to follow.

Gear manufacturing as practiced today leaves no place for sloppy design or sloppy shop practice, and by the same token it leaves no place for lax management in the production or in distribution. My impression is that limits of accuracy have tightened in almost the same proportion that the competitive situation has tightened. Therefore it is all for the best that the engineers, the manufacturing experts, the management men and those responsible for sales should all meet together as they do in AGMA and get their various activities in tune with each other like the various sections of an orchestra.

I admire the manner in which the gearmakers deal with techniques through the "forum method"—giving proponents of each an opportunity to present his case and a chance for each person in the audience to evaluate the methods in connection with his own problems. A case in point was the two-panel forum at the recent meeting—one on gear shaving, the other on gear grinding.

Many of us were surprised at the range of work now shaved—at the one extreme being "microscopic" gears involved in cameras, at the other extreme being huge gears used in ship propulsion. Many of us were equally surprised to learn of the extent to which gear tooth grinding is developing as a "tooth-creating" as well as a tooth-finishing method.

Also, I admire the open mindedness of the gearmakers in considering such things as hydrodynamic transmissions—as they did in the case of the paper by John Swift of Ford Motor Co. By not hiding their heads in the sand as far as this supposedly competing system is concerned, they heard this piece of good news: "In general, to achieve maximum results with a hydrodynamic transmission, it usually is necessary and desirable to use mechanical gearing. Thus we see that the hydrodynamic transmission actually broadens the field of transmission and hence can increase the use of gears rather than decreasing or replacing their usage."

WITH THE MACHINE BUILDERS: With the cooperation of the Pennsylvania Railroad and Capital Airlines, I was able to be with the gearmakers on the shore of Lake Michigan and with the machine tool builders on the Boardwalk at Atlantic City—even though I did have to miss the Metal Show at Philadelphia.

There is a considerable degree of "cross membership" between the American Gear Manufacturers Association and the National Machine Tool Builders' Association—at whose 47th annual meeting I was a guest.

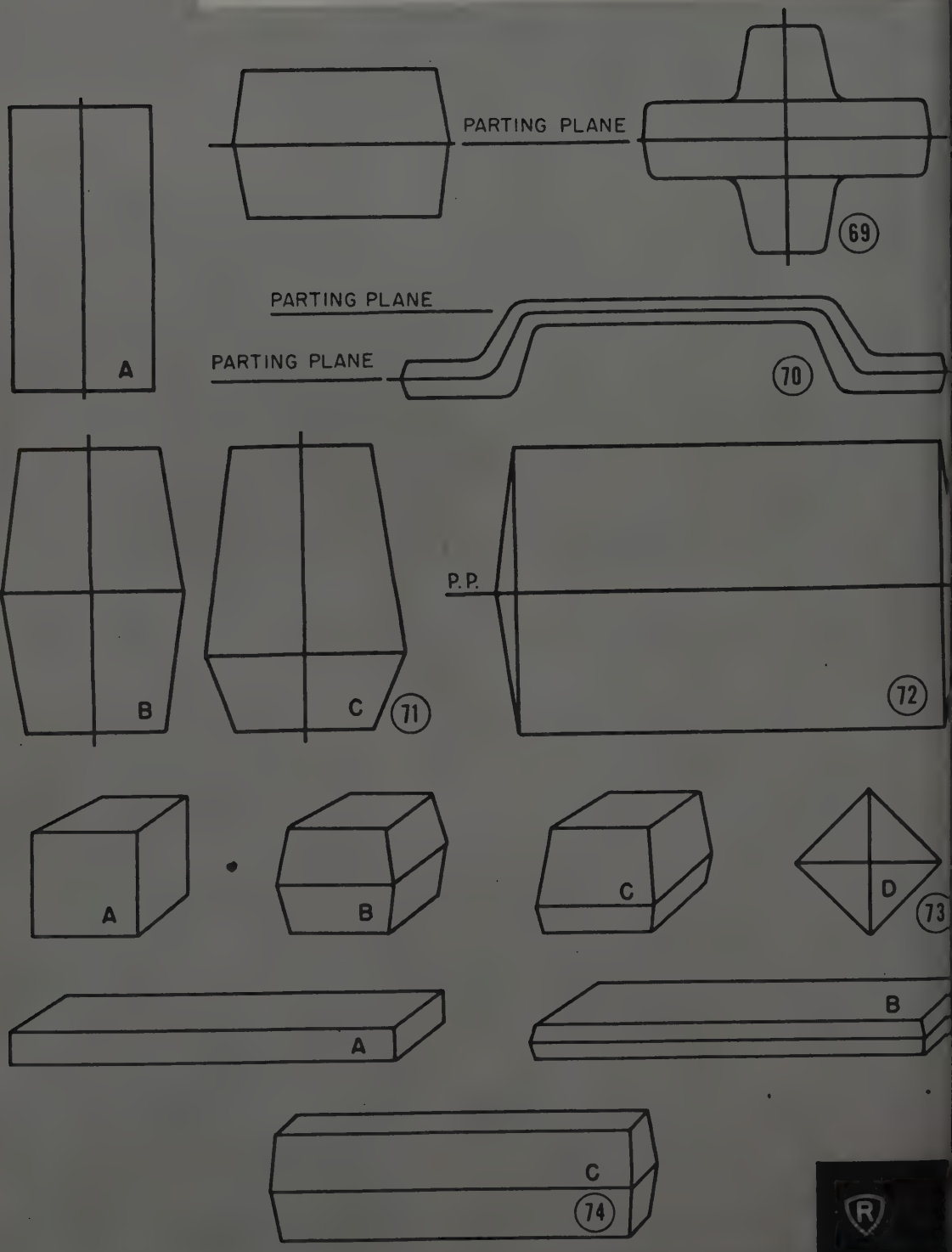
Current records indicate that of the approximately 190 companies making up the National Machine Tool Builders' Association, at least 17 manufacture machines, tools, gages and testing equipment directly concerned with gearmaking. Of these 17 companies at least eight make gear equipment their major activity. In other words, it has been—and continues to be—up to the machine tool builders to devise and build the ways and means by which geometrical theories of gear scientists are translated into precision gears on a production basis. This is an excellent example of the manner in which the machine tool industry ties in with the American system of manufacturing.

As compared with the AGMA, the NMTBA in its meetings has for many years leaned toward discussion of the economics of production rather than toward the mechanics of production. Its economics, however, are of the down-to-earth variety which seeks to interpret the engineering improvements of machine tools in terms of better manufactured products, lower cost in their manufacture and better working conditions in industry.

One of my favorite economists of that practical school is Al G. Bryant, who retired as president of NMTBA at the Atlantic City meeting but who continues to go up and down the country with common sense preachments such as this: "The influence of American machine tools on the manufacture of goods is not limited to so-called 'mass production'. In Europe it is taken for granted that everything in America is produced in enormous quantities and that highly productive machine tools are applicable only to such large volume manufacture.

"As a matter of fact in America a majority of manufacturers actually are engaged in producing items that are not needed in enormous quantities. The genius of America lies not so much in the theory of mass production, as in the principle of interchangeability of parts, which is applied to 'small lot' as well as mass production. Therefore, influence of widespread application of modern machine tools to general manufacture as well as to mass production profoundly affects the industrial strength of America."

FUNDAMENTAL



Forging Practice

Designing a part to be produced by forging techniques requires careful attention not only to factors affecting the part's ability to perform in service, but also the features that will permit use of good forging practice in its manufacture

By WALDEMAR NAUJOKS

VARIOUS factors in a proposed metal part to obtain the best shape and size of that part for its work as one member of a machine or mechanical device must be considered by the design engineer. He must consider strength, size, shape, material, wear, life, balance, and other factors, depending upon the requirements of the particular part he is designing.

In addition to the strictly design phases of the part from the mechanical design viewpoint, it is important for the designing engineer to have a general knowledge of the various methods that are used to make metal parts on a production basis. He should be reasonably familiar with forging, casting, stamping practice, screw machine work, and other industrial methods for making metal parts. He then can determine which method is best suited for his requirements, which will permit him to develop the design so as to make the part in the easiest way.

Forging design embraces factors that must be incorporated to make the part a practical forging and also the factors desirable to make the forging so that it will develop maximum properties with a minimum amount of work. If the designed forging is difficult to make, the cost is increased, perhaps considerably; it is also possible that the forging is not as good as it should be, from the structural standpoint. It is desirable to know some of the basic requirements that are necessary to include in the shape of the part, so that it permits the use of good forging practice. It is always easier to develop the original design correctly for forging practice than to attempt to make design changes after the design of the entire machine is completed.

Drop Forging Design—Of the several methods by which forgings can be produced, the largest portion of forgings made by the use of impression dies is made as drop forgings. First consideration will be the requirements of the drop forging to make it a better and easier part to produce. In the discussions of the several items desired, it should be remembered that the rules are not entirely rigid and that drop forgings can be made without using the rules in their entirety, but that by following the suggestions as much as possible, the drop forging has been designed to make the best possible forging for that particular part.

Parting Line—*The parting line* is the first consideration given to a forging that is to be produced as a drop forging. The parting line divides the forging into two parts so that the upper part is machined in the top die of the set of drop forging dies and the bottom part machined into the bottom die. It is desirable, generally, to have the parting line, which is really a parting plane, at exact right angles to the direction of the drop hammer stroke, which is vertical. And since the hammer stroke is down and up, the parting plane of the drop forging should be in the horizontal plane, if that is possible. Generally, symmetrical forgings are parted so that half of the forging is in the top die and half in the bottom die. Fig. 69 illustrates parting planes at right angles to the stroke of the drop hammer, with the parting plane dividing the simple geometric figures evenly. The flat, horizontal parting plane is the normal, or basic method of parting the drop forging for production in a set of impression dies. Dies are usually referred to as "normal" or "flat faced" impression dies. It should be noticed particularly in the forgings shown in Fig. 69 that the symmetry of the parts tends to keep the top and bottom dies in alignment

Fig. 69—Normal parting planes
Fig. 70—Die parting in two planes
Fig. 71 (A)—True cylinder; (B) cylinder parted evenly and draft added; (C) cylinder parted unevenly and draft added
Fig. 72—Parting plane on cylinder in horizontal position

Fig. 73 (A)—Cube without draft; (B) draft on cube center parting; (C) draft on cube uneven parting; (D) position of cube to obtain natural draft
Fig. 74 (A)—Rectangular bar without draft; (B) rectangular bar with parting plane along narrow side; (C) rectangular bar with parting plane along wide side

and that there is nothing in the shape of the forgings or the dies that would tend to make the top or moving die shift out of alignment. Factors that might cause die shift on the forgings shown, are not shape factors and need not be considered here.

For practical impression die forging on drop hammers, it is desirable on certain shapes or types of forgings, to have the parting line in two or more planes. Forgings with angles in the horizontal plane, curves, or other changes from a flat shape, may be forged to advantage with the parting in two or more planes. Where the parting is in two or more planes, it is always important to design the parting line so that the top and bottom dies are always in balance with respect to side and end thrust of the moving die. Fig. 70 illustrates parting in two planes. Further positioning of the parting planes will be considered along with draft angles and other forging design factors.

Forging Draft—Forging draft is the taper given to impression die forgings so that the forgings can be removed from the dies readily. Everyone is familiar with the difficulty in trying to remove a round wooden peg from a board where the fit is quite snug. The same difficulty is encountered in removing a steel bolt or pin where the fit is very close. A mental picture of the hot plastic metal being forced into the die pockets under heavy impact so that the drop forging fits very tight in the die impressions, will make it easy to see the difficulty in removing the forging from the dies unless the sides are tapered to aid in the removal.

Any attempt to remove an average drop forging from the dies where the sides are straight or nearly straight would result in damage to forging and dies from the prying and forcing necessary. It has been found that if the sides of the forging are tapered to a small degree, impact of the drop hammer gives sufficient jar to the forging to keep it loose in the dies. Some types of forgings have curved sides so that it is not necessary to add draft. Where the sides are designed so that they already have sufficient taper, the forging is said to have "natural draft". In some cases it is possible to tip the forging (tilt it from a true horizontal plane) to form natural draft on the drop forging. The addition of draft to the forging and the positioning of the parting planes will be considered together.

Fig. 71 shows top and side view of a cylinder. 71A shows the cylinder with straight sides. If the cylinder is to be made as a drop forging in the position shown, the cylinder may be parted half way between the top and bottom faces. Draft is added by starting the taper outward from the top and bottom faces. The draft angles meet at the parting line, as shown at 71B. It is evident that if the drop forging were to be made as shown in 71A, it would be difficult to remove the cylinder from the dies, while if the drop forging is made as shown at 71B, the forging can be removed readily from the dies. For some reason, it may be desirable to have the parting line nearer to one of the ends, as shown in 71C. In that case, the draft is started from the face farthest away from the parting plane and continued until it reaches the parting plane.

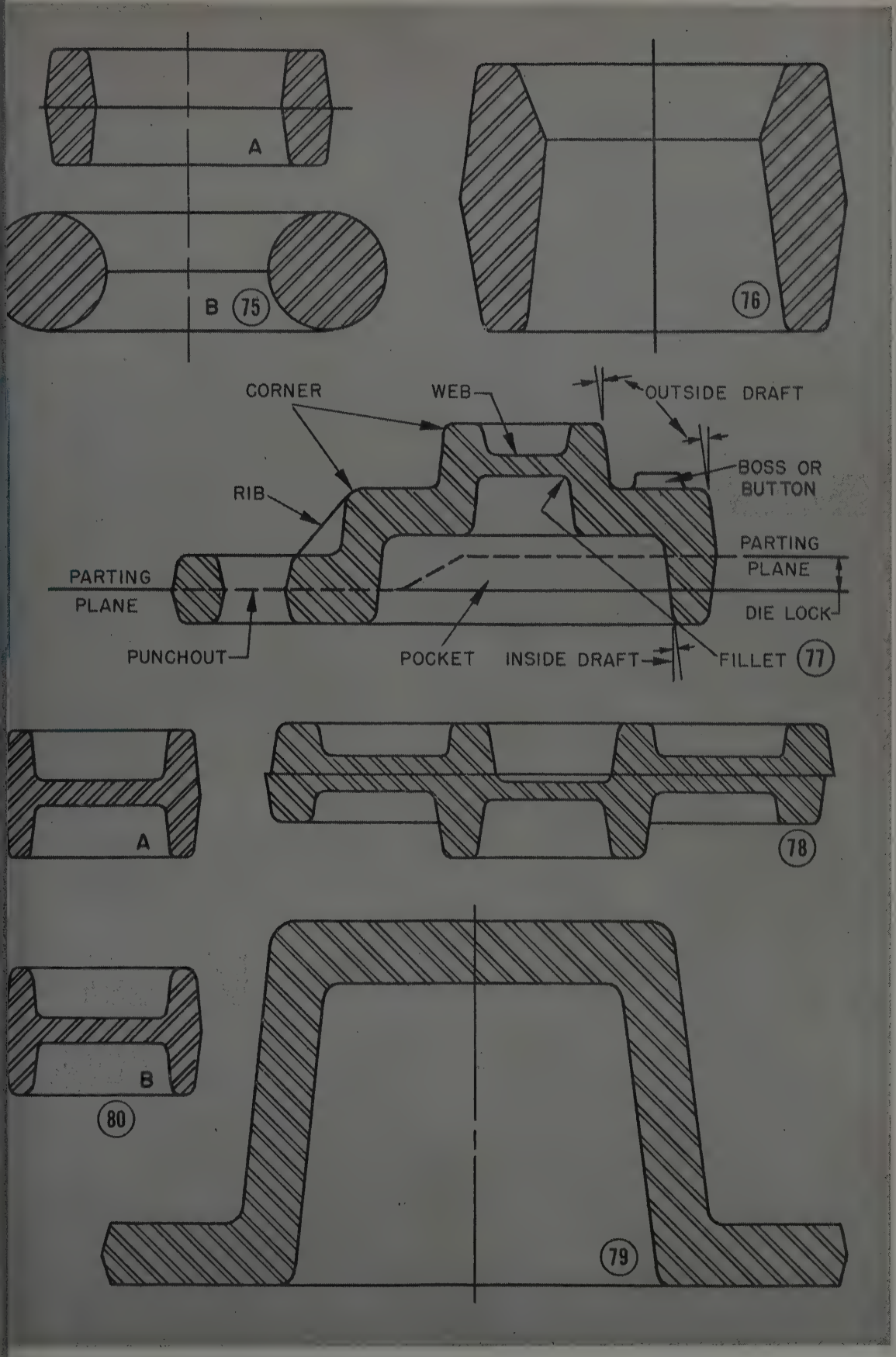
Draft which starts from the face nearest the parting plane must be given a greater angle so that it meets the draft of the other part at the parting line. This is also shown at 71C. Next, it may be desirable to place the cylinder in a horizontal position so that the axis is parallel to the parting plane of the dies, as shown in Fig. 72. It is seen that the diameter of the cylinder forms "natural draft" and the only draft to be considered is draft at the ends of the cylinder. On some types of forgings, such as the cylinder, it may be more desirable to use "dished draft" instead of the straight angular draft, where the ends are segments of spheres.

Average or normal draft angle is 7 degrees on all sides for outside draft for drop forgings. Inside draft, which is needed for pockets in the drop forgings and for holes, is normally 10 degrees. On forgings where the die impressions are deep and difficult, it may be necessary to increase draft angles on the outside to 10 degrees and draft on the inside walls to 15 degrees. Also, on drop forgings that are shallow, it may be possible to reduce the draft from 7 to 5 degrees on the outside and a corresponding decrease on the inside, but generally this is not desirable. Smaller draft angles tend to increase die wear which tends to reduce the life of the die impressions and usually increases the difficulty in maintaining forging sizes within commercial forging tolerances that are considered normal.

Fig. 75 (A)—Rings with square or rectangular cro sections require addition of draft; (B) rings with rou cross-section areas have natural draft
Fig. 76—Ring cross-section with outside and inst parting planes on different levels
Fig. 77—Forging terms on forging cross-section
Fig. 78—Die-shifted forging
Fig. 79—Flanged cup forging with deep pocket
Fig. 80—Poor and good I-beam design. (A) Sha corners and small fillets increase difficulty in maki good drop forgings. (B) Round corners and larg fillets improve forgings

All drop forgings can be considered as being made up of a combination of ordinary and well-known geometric shapes such as spheres, disks, cylinders, cones, cubes, ovals, prisms and round, square and flat bars. Adding of draft to the known shape can be shown and later the figures can be combined into some of the regular forged parts to illustrate the application of draft on them.

The sphere, or ball, does not require the addition of draft since it has natural draft. A disk is a short cylinder in which the diameter is larger than the length, and the same rules that apply to the cylinder also apply to the disk. The cube uses the same principle as the cylinder in the vertical position, as shown in Fig. 73. Fig. 73A shows the regular cube without draft; 73B shows the parting plane or line midway between the top and bottom faces and the resulting draft. 73C shows the parting line on the cube nearer one of the faces and the resulting draft. Fig. 73D shows the cube with natural draft. Result of adding draft to a bar with considerable length is similar


A
B
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CORNER
WEB
OUTSIDE DRAFT
BOSS OR BUTTON
RIB
PARTING PLANE
PARTING PLANE
DIE LOCK
PUNCHOUT
POCKET
INSIDE DRAFT
FILLET
77
A
78
B
80
79

to adding draft to the cube, as shown in Fig. 74. Fig. 74A shows the flat bar without draft and 74B has draft added to the bar, where parting is along thickness. Parting the bar along the width is shown in Fig. 74C.

It should be kept in mind that when bars or cubes are sections which are included in some forgings, it is not always possible to turn the entire forging to improve draft in one section. If the parting plane is not half way between the top and bottom faces, the draft is continued from the face farther away from the parting line until the draft meets the parting line. Draft angle from the near face will be made large enough so that the draft planes meet at the die parting planes. The principle is the same as has been shown for the cylinder in Fig. 71 and for the cube in Fig. 73.

Addition of draft to rings of the doughnut type and to square rings follows the same rules that have been given for the previous shapes. The doughnut type ring has natural draft while rings with rectangular cross-sections require the addition of draft. Several types of rings are shown in Fig. 75. As shown on previous figures, it is not necessary to have the outside parting plane of the ring midway between the top and bottom faces, nor is it necessary to have the inside and outside parting planes at the same level with each other. It is usually desirable to have the inside and the outside parting plane at the same height, if it is possible, but this is not essential. Fig. 76 shows the inside and outside parting planes at different levels. It should be noticed that the inside draft adds metal to the hole which makes the hole smaller at the parting plane. Outside draft increases the amount of metal at the parting plane.

The several illustrations just given have shown the addition of metal by the addition of draft. In actual design, it is often possible to provide draft by taking away metal. In other words, the designer can start at the parting line and remove metal to get the necessary draft angle. Because the forging provides sound, dense metal structure, the drop forging can have ample strength to perform its service, even with a smaller factor of safety. The 7-degree draft angle adds approximately ⅛-inch to the width of a side for each inch of vertical height. Or it will remove ⅛-inch on the width of each side for each inch of vertical height.

If a cylinder is 2 inches in diameter and 2 inches high, with the parting plane midway between the top and bottom faces, the draft will make the diameter at the parting plane 2¼-inches. Distance from the top to the center is 1 inch, so ⅛-inch is added to each side, or ¼-inch to the diameter. For various draft angles, the amount of increase on each side for 1 inch of drop will be found in the draft angle table in Part XIV. A study of the various geometric shapes and their relation to various types of forgings will soon develop that design sense which will permit the designer to make use of the draft angles to the best advantage in his design of mechanical parts.

Previous articles in the current forging series appeared in the following issues of STEEL:

June 7, p. 100	Aug. 16, p. 94
June 21, p. 98	Aug. 30, p. 59
July 5, p. 76	Sept. 13, p. 100
July 19, p. 99	Sept. 27, p. 89
Aug. 2, p. 91	Oct. 11, p. 101
Oct. 25, p. 78	

Fillets and Radii—*Fillets and radii* are included in the design of mechanical parts. They are used to blend surfaces which have different planes of direction with each other. It has been mentioned previously that it is difficult to change the flow of plastic metal which is moving in one direction, to flow in a direction which is at a sharp angle from the original direction of flow. An automobile traveling at a fair rate of speed must have a suitable radius in which to make a turn to change its direction of travel. In the same manner, when plastic metal is flowing in one direction, it must have ample radius to turn into another direction. It is always desirable to have the radii and fillets as large as possible on all drop forgings to obtain good grain structure in the forgings and to make sure that the fiber structure maintains its continuity.

Abrupt changes in direction with small sharp fillets or radii tend to promote broken fibre structure. It can be pictured that a sharp corner on a forging requires a sharp angle in the die pocket. In trying to fill the sharp angle with the hot plastic metal, it is necessary to exert severe impact pressure. This pressure tends to concentrate itself at the sharp corner in the die and this in turn, tends to start a crack at the sharp corner, resulting in reduced die life.

Also, if the forging has a sharp pocket, the die must have a die plug with sharp corners. Sharp corners do not permit the flow of the plastic metal to change its direction readily and the result may be a cold shut in the forging. Fig. 77 shows a forging which has corners, fillets, draft angles and other parts of the forging indicated. The general rule is to make corners, fillets, and radii on the drop forging as large as the design will permit.

Die shift—Die shift occurs when the part of the drop forging shaped by the bottom die is not in alignment with the part shaped by the top die. Die shift may be caused by improper alignment of the top and bottom dies. It may also be caused by a type or shape of drop forging in which there is a tendency for the top, or moving die to move sideways or endways out of alignment. Some drop forgings just naturally tend to seat themselves properly while other drop forgings are of a shape that cannot be positioned easily so as to make the dies stay in good alignment. It is necessary for the drop hammer ram to have running clearance; if there is the tendency toward side or end pull, it is possible to develop die shift. Where the die shift tendency exists, due allowance must be made in fitting the dies in the hammer equipment. Fig. 78 illustrates the result of die shift in the forging. It should be noted that if a die has shifted 1/64-inch out of true alignment, the result is an overall die shift of 1/32-inch on the drop forging. Sometimes the die keys work, causing a die shift on the drop forgings.

Pockets—Pockets in drop forgings should be given careful consideration in their design on the forged part. The pocket or depression on the drop forging must have a corresponding raised die section, usually termed die plug. The raised die section, or plug, stands as a high island in the middle of a pond, and the flow of the plastic hot metal over this raised section resists the change in direction of flow if the change in flow direction is too sudden.

Raised die plugs have a tendency to wear more rapidly than the rest of the die impressions. It is good design practice to make all connecting radii and corners as large as possible to help the hot metal to move over the raised sections or plugs more easily. Results will be good sound metal structure in the drop forging. The more gradual all sweeps are made, the better are the forging results. Fig. 79 illustrates good forging design with a drop forging that has deep pockets. Notice the generous radii that connect the pocket corners.

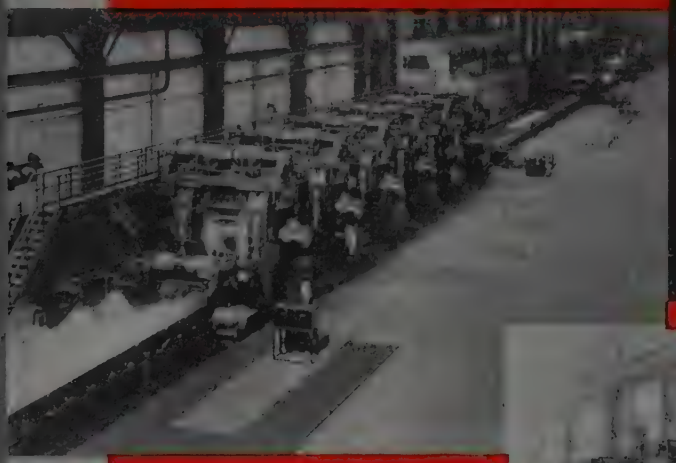
Ribs and Thin Sections—Ribs and thin sections must be studied with care in the design of the drop forging. Conditions in a set of drop

(*Please turn to Page* 126)

Hot Strip Mills

Designed and Built by

MESTA



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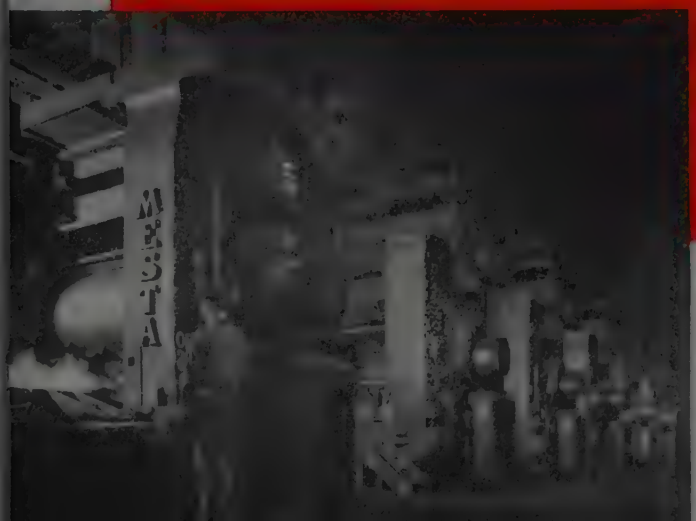
Continuous Hot Strip Mill

Mesta 68" Four-High Continuous Hot Strip Mill

Mesta 79" Four-High Continuous Hot Strip Mill

Mesta 56" Four-High Continuous Hot Strip Mill

Mesta 96" Four-High Continuous Hot Strip Mill



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Wet-drawing of high-carbon wire on Vaughn machines demands extreme care and rust-free material—not only for sustained high production of wire to meet rigid specifications but also to afford die protection

Wire Drawing Speed Increased 25%

. . . by use of phosphate lubricating compound

AMORPHOUS metaphosphate compound, known as Banox and produced by Calgon Inc., has been in use at Jones & Laughlin's Aliquippa, Pa. wire mill since June, 1947. This compound inhibits rust and also lubricates wire in process, affording increased speed in drawing. Engineers report this is the first application of the material in wire-drawing, although it has been effectively employed by manufacturers of household appliances, metal furniture, and automotive bodies and parts, as a rustproofing and paint-bonding coating prior to painting.

Protection of the wire against rusting while in process not only has permitted an increase in drawing speed but also has produced a sharp reduction in damage to dies and wire, and fewer delays for replacing and restringing dies.

Because the film deposited on the wire is not water-soluble, and assures a degree of lubrication for the wire in subsequent drawing, amount of lime picked up to carry lubricant is not critical as in conventional practice, it is reported. Formerly, a light coat of lime or a too-heavy "flaky" coat required redipping of the coil; otherwise, too little lime frequently resulted in insufficient lubrication, with damage to dies and wire, and too heavy a lime coat would flake off, exposing bare wire with much the same results. Less lime may be used safely when the phosphate material is incorporated in the cleaning operation.

Rust is a particularly serious problem in such a mill, according to J & L engineers, because the atmosphere frequently contains corrosive sulphur gases, acid fumes, and moisture. The speed in which corrosion occurs would startle the layman—showing itself in the brief period between pickling and liming.

At the Aliquippa works coils of high-carbon wire destined for wet drawing are dipped successively in an 8 to 10 per cent sulphuric acid pickle; a water rinse; a 1 per cent Banox solution for 4 minutes; another water rinse; and a bath of 8 to 9 per cent hydrated lime. Drying in a flash baker is the final step. This high-carbon material usually is 0.028 to 0.066-inch in size when readied for final reduction on Vaughn wet-drawing machines. Finished sizes often are on the order of 0.007-inch.

Rust-protection of wire in process also affords less scoring—less brightness of the finished product. Brightness, to the experienced draw bench operator, is a tell-tale sign of poor lubrication during drawing operations, and failure to meet the rigid standards of uniform gage which fine high-carbon wire must attain. This type of wire, metallurgists point out, is commonly used in the making of such products as drag lines, cable and drill rig lines for the petroleum industry, and other wire rope in which strength and uniformity are paramount.

Still another advantage in use of the rustproofing compound is cited by the steel company engineers. They explain that when coils of wire stock are dipped in the battery of tanks comprising the cleaning operation, they have an "Achilles' heel"—a small area that does not get the benefit of the acid, water rinse, or lime because the wire is in contact with the yokes on which the coils are raised and lowered. The rustproofing provides some protection and lubricity for these areas which otherwise would be subject to rusting and perhaps cause trouble in further reductions.

Limed coils sometimes must be held in temporary storage until there is room to handle them on the drawing machines. And rust has been a headache, because ordinary materials used for rustproofing washed off in the lime tub. Tests made by the metallurgists in their initial trial of the compound indicated that limed coils treated with this material could be exposed four to five times longer before any rust could be detected.

Copper-flashed wire also is effect-

(*Please turn to Page* 132)

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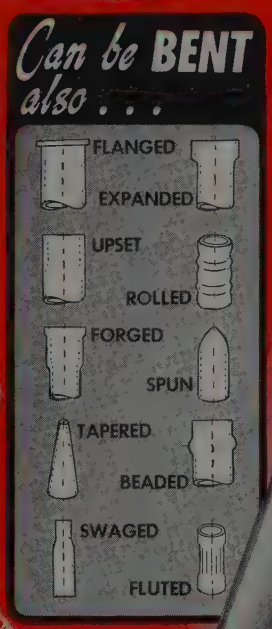

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ASM Honors 75 Men for Furthering

PROGRESS IN ALLOY STEELS

ONE of the features of the 30th National Metal Congress and Exposition held in Philadelphia, Oct. 25 to 29, was a "Salute to Alloy Steel" in celebration of the 75th anniversary of the first use of alloy steel in the Eads bridge over the Mississippi river at St. Louis. As pointed out in last week's issue, activities at the convention in connection with the "Salute to Alloy Steel" included a special exhibit on the stage of the Convention Hall showing the important role of alloy steels in the modern life of the nation, historical and technical papers on alloy steel and special awards to individuals who have made outstanding contributions to the progress and development of alloy steels.

Announcement of these distinguished service awards was made by Francis B. Foley, out-going president of the American Society for Metals, at the annual banquet. The names of the 75 men thus honored, with citations briefly describing their contributions, follow:

ROBERT R. ABBOTT, Cleveland Heights, O.—A pioneering authority on the intelligent use of alloy steel, who influenced practices in many consuming industries.

O. H. AMMANN, New York—For extensive application of the strong structural steels to long span highway bridges.

ROBERT S. ARCHER, Climax Molybdenum Co., New York—For systematization of knowledge basic to the science of metals.

WILBUR H. ARMACOST, V. P., Combustion Engineering Co., New York—For promoting the use of low alloy steels for boilers and auxiliaries in high temperature service.

EDGAR C. BAIN, V. P., Carnegie-Illinois Steel Co., Pittsburgh, Pa.—Investigator, author, advisor, administrator in many phases of alloy steel development.

H. G. BATCHELLER, Allegheny-Ludlum Steel Co., Brackenridge, Pa.—For supporting a lengthy program of development of electrical sheets of improved magnetic properties.

QUINCY BENT, Bethlehem Steel Co., Bethlehem, Pa.—For leadership in the conservation of strategic alloys in World War II.

A. L. BOEGEHOLD, General Motors, Detroit—For his early application of hardenability principals to more intelligent use of alloy steels.

HYMAN BORNSTEIN, Deere & Co., Moline, Ill.—Pioneering metallurgist in the farm implement industry, responsible for many applications of special steels.

D. K. BULLENS, New England Auto Products Corp., Pottstown, Pa.—For his inspirational work in collecting and publishing American practices in "Steel and Its Heat Treatment."

H. T. CHANDLER, Vanadium Corp. of America, New York—For early development of chromium-molybdenum and vanadium steels and their application to automobiles.

JOHN L. COX, The Midvale Co., Philadelphia—For early adaptation of alloy steels for armor and projectiles to industrial purposes.

EDMUND S. DAVENPORT, United States Steel Corp., New York—For his revealing studies on isothermal transformation, leading to greatly improved heat treating techniques.

C. N. DAWE, Detroit—For development of nickel-molybdenum steels and their application to automotive parts.

ENSLO S. DIXON, Refinery Engineer, Texas Co., New York—For early and extensive application of chromium steel in refining equipment.

BENJAMIN F. FAIRLESS, Pres., United States Steel Co., New York—For support of many projects that improved the quality and widened the utility of alloy steels.

C. B. FRANCIS, Pittsburgh, Pa.—Author of the most authoritative work on American practices in steel manufacture and treatment.

HERBERT J. FRENCH, International Nickel Co. New York—For promoting the industrial uses of engineering alloy steels.

EMIL GATHMAN, SR. Gathman Engineering Co. Baltimore—For conservation of alloys and alloy steel by improved ingot mold designs.

H. W. GILLETT, Battelle Memorial Institute, New York—Investigator, author, critic, organizer of research into alloy steels.

FRANK P. GILLIGAN, Farmington, Conn.—For pioneer guidance and 25-year chairmanship of S.A.E. Committee on Steel Specifications.

NORMAN P. GOSS, South Euclid, O.—For discovering a commercial process for inducing directional crystallization in transformer and electrical sheet.

H. W. GRAHAM, Jones & Laughlin Steel Corp., Pittsburgh, Pa.—For perfecting manganese steels used widely for oil field equipment, armor and other heat treated parts.

HENRY B. GREENSTEAD, Algoma Steel Corp., Sault Ste. Marie, Ont., Canada—For applying alloy steels to a wide variety of industrial purposes in Canada.

FREDERICK J. GRIFFITHS, 710 Ohio-Merchants Trust Bldg., Massillon, O.—For his influence in the early development of the alloy steel business in America.

MARCUS A. GROSSMANN, Dir. of Research, Carnegie-Illinois Steel Corp., Pittsburgh—For evaluation of the influence of specific elements on the hardenability of steels.

T. W. HARDY, 55 Glen Ridge Ave., St. Catherines, Ontario, Canada—Canadian metallurgist, for early recognition of the advantages of fine grain in alloy steels for severe services.

ISAAC HARTER, Chairman, Babcock & Wilcox Tube Co., Beaver Falls, Pa.—For continuous improvement of steam boilers and auxiliaries through correct application of alloy steels.

WALTER G. HILDORF, Timken Roller Bearing Co., Canton, O.—For research and steelmaking developments that extended the use of alloy steels in high temperature equipment.

ZAY JEFFRIES, V. P., General Electric Co., Pittsfield, Mass.—For his early systematization of knowledge basic to science of metals.

CHARLES MORRIS JOHNSON, 731 Orchard Ave., Pittsburgh—For early perfection of analytical methods for chemical control of alloys in steel.

J. B. JOHNSON, Materials Lab., Experimental Engineering Section, Wright Field, Dayton, O.—For establishing and maintaining quality standards in the aircraft and air engine industries.

WALTER E. JOMINY, Chrysler Corp., Detroit—For devising the hardenability test bearing his name.

AUGUSTUS B. KINZEL, Electro Metallurgical Co., New York—For early work on high yield strength steels and for leadership in studying the weldability of alloy steels.

ALAN KISSOCK, Laurelton, N. J.—For devising correct steelmaking processes, especially for the molybdenum alloys.

HARRY B. KNOWLTON, International Harvester Co., Chicago—For applying alloy steels to agricultural implements and farm tractors.

FRED LOOSELY, Dominion Foundries & Steel Co., Hamilton, Ont., Can.—Inventor and producer of alloy steel of improved machinability, largely used in Canadian armored vehicles.

WILLIAM J. MacKENZIE, Youngstown Sheet & Tube Co., Youngstown—For promoting use of alloy steels throughout American industry.

FRANK M. MASTERS, Consulting Engineer, Harrisburg, Pa.—For pioneering use of strong structural steels in long span railroad bridges.

F. E. McCLEARY, 1605 Chicago Blvd., Detroit—For developing molybdenum and chromium-vanadium steels and extending their automotive applications.

JOHN McCONNELL, 5431 N. Kenwood Ave., Indianapolis—For pioneering the production of alloy steels in the openhearth furnace.

HARRY W. McQUAID, Union Commerce Bldg., Cleveland—For distinguishing between abnormal and normal steels and interpreting the relationship between grain size and hardening properties.

JOHN MITCHELL, Carnegie-Illinois Steel Co., Pittsburgh—For leadership in the development of the National Emergency Alloy Steels.

N. L. MOCHEL, 606 Thayer St., Ridley Park, Pa.—For promoting the use of low alloy steels in heavy electrical generating and transmission equipment.

W. A. NEWMAN, Canadian-Pacific Railroad, Montreal, Quebec—For application of alloy steels to serve services on Canadian railroads.

J. H. PARKER, Chairman of the Board, Carpenter Steel Co., Reading, Pa.—For devising and producing alloy steels acceptable to the U. S. Navy and the budding automotive industry.

C. F. PASCOE, Canadian Car & Foundry Co., Montreal, Que., Can.—For improvement and development of alloy cast steels for general engineering use in Canada.

W. E. RUDER, 1674 Rugby Rd., Schenectady, N. Y.—For applying alloy irons and steels to electrical equipment and large steam turbines.

ADOLPH O. SCHAEFER, Midvale Co., Philadelphia—For development of special alloy steels for use in ordnance and heavy industries.

ROBERT B. SCHENCK, General Motors Corp., Detroit—For devising inspection and production methods whereby manganese steels could be widely used for automotive parts.

J. M. SCHLENDORF, V. P., Republic Steel Co., Cleveland—For pioneering and continuing efforts to promote the use of alloy steels throughout American industry.

ROBERT W. SCHLUMPF, 3731 Rio Vista, Houston, Texas—For utilization of alloy steel in oil well drilling equipment.

MARTIN H. SCHMID, Gen. Mgr. Alloy Steel Sales, Republic Steel Co., Cleveland—For promoting the intelligent use of alloy steels throughout American industry.

T. D. SEDWICK, 7429 Jeffery Ave., Chicago—For pioneering and constructive work in applying alloy steels to locomotive forgings.

CHARLES H. SHAPIRO, 401 N. Velasco St., Houston, Texas—For utilization of alloy steel in oil well drilling equipment.

BENJAMIN F. SHEPHERD, Chief Metallurgist, Ingersoll-Rand Co., New York—For developing the martempering technique.

FRANK T. SISCO, Alloys of Iron Research, New York—For carrying through the monumental review of literature concerning alloys of iron.

EARLE C. SMITH, Republic Steel Co., Cleveland—For applying science to the manufacture and use of alloy steels.

HOWARD STAGG, Crucible Steel Co., New York—Lifelong proponent of intelligent use of alloy steel, who influenced practices in many consuming industries.

O. L. STARR, Caterpillar Tractor Co., Peoria, Ill.—For early recognition of those properties of alloy steels that are indispensable to diesel engines.

BRADLEY STOUGHTON, Lehigh University, Bethlehem, Pa.—Educator of two generations of makers and users of fine alloy steels.

JEROME STRAUSS, Vanadium Corp. of America, New York—For pioneer work in the application of wrought and cast alloy steels to naval ordnance.

ERNEST E. THUM, Metal Progress, Cleveland—For gathering, interpreting and presenting information about alloy steels in all their aspects.

HENRY H. TIMKEN, JR., Chairman of Board, Timken Roller Bearing Co. Canton, O.—For vigorous support of efforts that widely extended the use of alloy steels throughout all industry.

RUFUS S. TUCKER, Mgr. of Sales, Alloy Div., Bethlehem Steel Corp., Bethlehem, Pa.—For continuous efforts toward promoting the use of alloy steel throughout American industries.

JOHN F. WANDERSEE, 11 McLean Ave., Highland Park, Detroit—For his pioneering work with alloy steel in automotive applications.

J. M. WATSON, 79 Monterey Ave., Detroit—For active promotion of the use of alloy steels in motor cars.

BLAINE B. WESCOTT, Gulf Research & Development Co., Pittsburgh—For application of alloy steels and irons in oil fields and refineries.

ALBERT E. WHITE, University of Michigan, Ann Arbor, Mich.—For contributions in the development, promotion and selection of steels for high temperature service in power plants.

WILLIS R. WHITNEY, Research Lab., General Electric Co. Schenectady, N. Y.—For initiating and supporting research into many branches of alloy steel metallurgy.

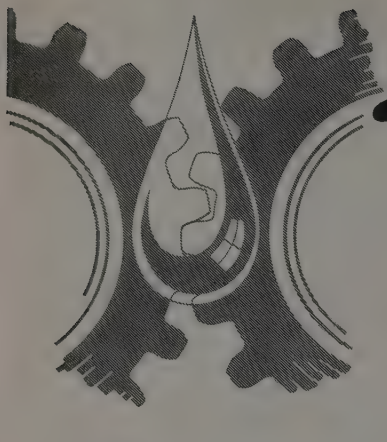
CLYDE WILLIAMS, Battelle Memorial Institute, Columbus, O.—For directing War Metallurgy Committee's researches into alloy steels.

K. D. WILLIAMS, Chevy Chase, Md.—For his efforts toward steady improvement of naval propulsion systems by the use of alloy steels.

WILLIAM P. WOODSIDE, Park Chemical Co., Detroit—For promoting the interchange of information about heat treatment and use of alloy steel during World War I.

W. H. WORRILOW, Pres., Lebanon Steel Foundry Co., Lebanon, Pa.—For promoting the use of alloy steel castings throughout American industry.

TRYGVE D. YENSEN, Research Lab., Westinghouse Electric Corp., Pittsburgh—For researches resulting in large improvement of the magnetic properties of iron alloys.



Lubricating OPEN GEARS

Speed, vibration, shock, reversal, intermittent action, exposure to the elements, contamination with metallics are among the severe operating conditions which efficient open gear lubricants are meeting

By JOSEPH A. RIGBY
Brooks Oil Co.
Pittsburgh

IN THE lubrication field, one problem of major importance is that of open gears. This has always been in existence, has been gradually relegated in modern designs but probably never will be entirely eliminated. For the maximum of service, minimum power consumption, ease of operation, quiet action and minimum maintenance expense, the supreme necessity is for the utmost in efficient lubrication.

Continued trends to higher speeds, greater load factors, increased frictional surface areas, exacting service or product demands and the critical factors of economies or what may be termed present day labor and operating costs have created the necessity for and development of lubricants with unusual characteristics for improvement in this service.

Open gears are usually subject to severe operating conditions in speed, vibration, shock, reversal, intermittent action, exposure to elements or weather, contamination with metallics and other forms of dusts, inadequate inspection or maintenance and frequently by inefficient lubrication in hit-or-miss methods. To this may be added incorrect alignment, excessive clearance in bearings and incorrect contact of teeth surfaces. Spur gears are the type most commonly used, but the trend of recent years has been to helical and double herringbone design with the inherent factors of greater loads on the teeth and the sliding or wiping action which creates a more severe problem for lubricants to function in protection.

For the utmost in gear protection a lubricating film must exist to keep metal surfaces apart. With some form of circulating or spray system this would not be a difficult problem; however, it is one which is not practical with open gears. It therefore becomes necessary to provide a lubricant that can be applied infrequently but which will furnish a film protection to extend over a long period of time. The lubricating film must be one which will provide the utmost in protection for the conditions described.

Applications of the lubricant may be by various methods such as brushing, swabbing, pouring, spraying, dripping and by splash or dipping. One method will not suffice for all open gearing because of design factors, operating conditions and varied opinions of the personnel responsible for the equipment and duties of lubrication.

Physical Properties Required—

1. Film strength of 50,000 pounds per square inch minimum by Timken testing machine, or 83 pounds on the lever arm. This is 2½ times the qualification necessary for extreme pressure lubricants.
2. Adhesiveness in which affinity for steel and other metals develops maximum adhesion and prevents drippage or creeping, should retain a flexible coating in nature despite extreme distortions in applications.
3. High degree of water repellence. Should retard washing off and create a lubricating film under moisture or water conditions.
4. Afford an excellent protective coating in that it will not etch or corrode metals. Lubricant should never be acidic.
5. Stability of physical characteristics. It should not bleed or change physical condition within range of higher than usual temperatures for this type of service.
6. Low temperature factors. While having a solidifying action by decreased temperature as low as —40° F, it should not harden, crack or decrease in adhesion. The film or coating should be of a flexible nature to withstand distortion.
7. Abrasive resistance should be extremely high for the lubricant. It should not wipe off or be removed in handling by workmen's hands or gloves. It should be extremely repellent to adhesion of scale, metallics and other forms of dust or contamination.
8. Resistance to corrosive or soluble actions of salt or sea water and acidic vapors or solutions should be effective.
9. It should be possible to remove by ordinary solvents but should be highly impervious to lubricating oils and greases.

Selecting Correct Lubrication—To select the correct gear lubricant it is necessary for those with the responsibility of efficient lubrication and maintenance of equipment to investigate past practice and check the results being accomplished with modern improved products. Important factors are speeds, temperatures and methods possible to use in application. These features will have a governing action in selection of the correct type and grade of lubricant suitable for performance expected.

Technical or chemical data need not be a salient or necessary consideration as actual accomplishments can only be determined by trial and use. The cost of lubricants must be considered in the view that for quality products and best performance the desirable lubricants cannot be made or marketed at low costs. Processing and compounding with the use of expensive additives increase the manufacturing costs of lubricants but have been proved to decrease the lubricant consumption costs in the over all and final results.

In recognition of the necessity for improvement in open gear lubri-

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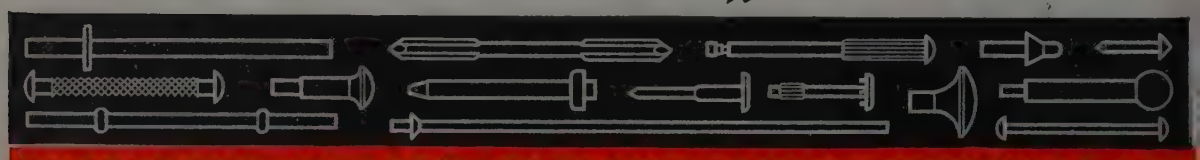


JOHN HASSALL, INC. • OAKLAND AND CLAY STREETS • BROOKLYN 22, N. Y.

cation, lubricants with exceptional characteristics for this service have been developed. These are purely petroleum leaded compounds, without fillers, made in heating and solvent types. The heating type is the basic products. The solvent type has a rapidly evaporating solvent for ease of application. The solvent does not create a hazardous condition any greater than that of any other lubricant for such service. Light, medium, heavy and extra-heavy are the four grades available in each type, for flexibility in the application for the variations in service.

Improvements in Test Procedure— In recognition of the fact that film strength is a dominating factor in open gear lubrication, study and research have developed extremely high strength film lubricants. The so-called "four gram test" was recently developed. In this, four grams only are applied to the cup and block with no additions or replacements during the test period. First tests with open gear lubricants were considered good if the endurance was for 3 minutes without scoring, exceptional at a test of 5 to 10 minutes and astounding when it was possible to find a lubricant which would run for 20 minutes.

Now the improved lubricant consistently runs for 30 minutes or longer without scoring, thus developing a guarantee for the maximum in film strength and endurance. Lubrication authorities now agree that this test procedure and accomplishment is another technical achievement which has been duly credited to the manufacturer of quality petroleum products and is acknowledged to be of paramount importance in the selection and application of open gear lubricants.

Recent Accomplishments — Case histories of unusual accomplishments over a period of several years have been numerous. In the unloading of coal from barges at a large coke plant, using 5-ton clam shell buckets, the motor-operated hoist is equipped with double herringbone cut teeth pinions and gears. This operation is reversing, intermittent, with some vibration, high speed, severe shock and subject to contamination with coal dust. A high grade leaded plastic compound was applied once in 24 hours but failed to prevent wear of expensive gearing. A heavy grade of the improved type applied once every 10 days provides adequate protection against wear at a cost of 25 per cent less per pound.

Open gearing on the table rolls of a large blooming and billet mill was lubricated once or more in 8 hours with a gear shielding compound. Substitution with this improved lubricant decreased applications to a minimum of 3 days with half the quantity used.

In a steel plant where plastic and gear-shielding compounds had dripped off and built-up to large accumulations on the floor, by substitution of the improved lubricant this condition was eliminated. This accomplishment has been one of merit on overhead traveling cranes and other such equipment where drippage had been an objectionable nuisance.

Gearing subject to water and particularly hot water has been greatly extended in service, quieter in operation and the power consumption reduced with this lubricant. On shears, presses, machine tools and various other metal working equipment, drippage of gear lubricant and frequent applications are eliminated. Applications are now extended from days to weeks. In the aluminum and other nonferrous industries where cleanliness and contamination of products are factors of observance, the accomplishments have been noteworthy. As a matter of fact the original development of this lubricant was for such demanding service in the maximum of adhesion and cleanliness of equipment.

Where steel plant open gearing operated almost constantly, it is necessary to shut down or apply lubricants by pouring through small openings. Shutdowns created loss in production; throw-off of the lubricant from gears in motion was wasteful and objectionable in clean-up time and labor costs. Application of the improved type by air spray eliminated shut downs and waste of lubricant. It also created better film coverage where actually needed and developed safer working conditions by this method of application.

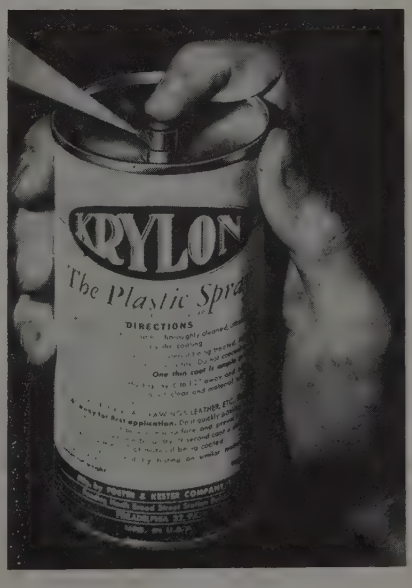
In steel plant service of gears subject to contamination by scale, adhesion of scale to this lubricant has been negligible. In one case of a slab piler, lubricants had been discontinued and the gears operated in a dry condition in the attempt to extend service over the maximum of 4 months. With the use of the lubricant described, the service has been extended to over 1 year with indications of increasing to several years.

Universal joint segments and pod wabbler drive of mills have constituted problems in lubrication where no method is provided for replacement of lubricant while the drive is in motion. Applications have to be made during shutdown periods and as a practice by pouring methods. With the factors of bad water conditions, impact or shock loading, reversing and sliding action, this lubricant has retarded wear, preserved flexibility and developed economies in replacement costs because of the lasting qualities.

Of prime importance is the extraordinary thin film, almost transparent in nature and one which does not build-up in excessive deposits. This guarantees free movement of gears, prevention of a locking action during precold weather and a minimum of frictional drag for the best of economies in power consumption. There has been no case where it has been necessary to soften the lubricant by heating for freedom or ease in starting. This is particularly true in outside service or in older plants where temperatures are extremely low be-

(*Please turn to Page* 135)

PUSHBUTTON PLASTIC SPRAYING: Rust, tarnish, corrosion and deterioration of tools, machine parts and instruments may be prevented with a transparent plastic coating, applied by pressing a button on top of a compact, self-contained spray can. The colorless coating, named Krylon by its manufacturer, Foster & Kester Co. Inc., Philadelphia, is forced out under pressure and is said to adhere to practically any surface. Removable by a special solvent available from the company, the satin-smooth plastic coating is claimed to be resistant to discoloration at high temperatures, water, alcohol, alkali and acids, mineral oils, grease and chemical fumes. Large parts may be dipped in tanks or sprayed



LETTERS *to the Editors...*

Found—Great Savings

There is one matter on which I wish to seek your urgent advice and recommendation. I recall, although I cannot remember the date of the issue, a technical article describing a new method of perforation of steel sheets and plates where the dies rotated, punching or perforating the steel as the sheet was fed through the machine. This method appealed very much to me as it obviously represents a very great savings in capital outlay for dies—and also the maintenance cost of dies—as compared to the flatbed method of perforating steel where the dies have to be made of such a size that will perforate the whole sheet or plate at one pressing.

I would very much like to see the method in operation in one or more plants in U. S. A. Would you be so kind as to advise me the name of the manufacturer or manufacturers of the type of equipment referred to in the article.

Murray Angus
(of Turramurra, N.S.W., Australia)
c/o Matson Navigation Co.
San Francisco, Calif.

A copy of your letter has been forwarded to Lempco Products Inc., Dunham Road, Bedford, O., maker of the machine referred to in the article appearing in the July 14, 1947 issue of STEEL.—The Editors

Way Back in '40

Can you refer us to the manufacturer of the instruments described in the article, "Instrumentation in Arc Welding", which appeared in STEEL, July 22, 1940, page 60?

W. A. Faust
Process Engineering Department
The Linde Air Products Co.
Tonawanda, N. Y.

The manufacturer of the instruments described in the article is Harris Calorific Co., 5501 Cass Ave. N.W., Cleveland 2, O., according to R. E. Kinkead, author of the article.—The Editors

Surface Finish Standard

In the July 19, 1948 issue of STEEL, there is an article titled "Surface Finish Standard", written by C. R. Lewis and A. F. Underwood. I have thoroughly read that article and have found it to be very interesting because it is on a subject that is extremely important to metal working industries and because we are attempting to set up a satisfactory method of control of metal surface finish in our plant.

We have inquired about and had demonstrations of different types of surface finish measuring and comparing instruments, but none of them have, we feel, been applicable to use by our inspection and/or manufacturing departments because of the instruments' complexness and the nonreproducibility of results.

I would appreciate it if you could suggest to me the instrument which these men used for comparing the standard sample with those produced in daily work. I would also be interested in examining one of the small containers of surface finish blocks which will be available to industry as pointed out in this article.

W. L. Born
Underwood Corp.
Hartford, Conn.

We forwarded Mr. Born's letter to Mr. Lewis and Mr. Underwood. The following is their reply:

There is little doubt but that most machined parts are inspected by feel or visual observation. It is intended that the geometric standards will allow a direct comparison for roughness by feel. The fingernail or a coin, held by the fingers, is frequently used as a readily available device and generally works quite satisfactorily after some experience has been gained.

When careful inspection is required, particularly on borderline cases, it is necessary to use an instrument which will give a definite number. The Profilometer and the Brush Analyzer are well-known for this purpose. The geometric blocks are expected to have a place in the application of such instruments by allowing direct comparison at the same roughness level between known and unknown surfaces.

The geometric character of these surface blocks allows calculation of considerable precision of the readings to be expected from instruments of various tip radii, and the surfaces have been designed to facilitate their use with stylus instruments.

Visual comparison or roughness using these blocks is not recommended, since the appearance of a machined surface is strongly influenced by the material of which it is made as well as by the surface roughness.

The first section of the complete kit of geometric surface standards is being manufactured and the complete selection is expected to be available soon.
—The Editors

Organic Finish

I have noted your timely article on organic finishes for metal products that appeared in the June 14th issue of STEEL.

On page 104, you mention preparations of copper and brass for painting. The only process mentioned is the oxalate method. We would like to call your attention to the fact that our Ebanol "C" process is used for preparing copper, brass and other copper alloys for painting. This process produces a cupric oxide coating that is an excellent base for all types of organic finishes. The process can be modified to produce various colors on the surface of the copper alloy to enable lighter shades of color to be used when a light finish is to be applied, such as ivory or green.

This process involves the use of an alkaline chlorite solution under U.S. Patent No. 2,364,993.

Dr Walter R Meyer
Technical Director
Enthone Inc.
New Haven, Conn.

Available—Yes!

We were very much interested in the series of articles you recently published on Tool and Die Materials and are wondering whether or not this information is available in booklet form. If so, will you please consider this an order for three copies and advise us cost so that we can issue a confirming order to cover.

J. D. Searles
Director of Purchases
Liggett Spring & Axle Co. Inc.
Monongahela, Pa.

Reprints in booklet form have been made and are available now at $1.00 each.—The Editors

Wrong Label

There is one error in the table heads that may cause confusion in the article "Shot Quality—How It Affects Fatigue Life" (STEEL, Oct. 11, p. 126). Table V is, as you state on page 127, Almen gage numbers, but the table is headed Rockwell hardness numbers. The table should have been headed "Almen Reading A2 Strip in Thousandths of an Inch" or "Almen A2 Strip Readings".

F. P. Zimmerli, chief engineer
Barnes-Gibson-Raymond Division
Associated Spring Corp.
Detroit, Mich.

Radiology Bibliography Published by St. John

Publication of "Bibliography on Industrial Radiology 1945-1948" has been announced by St. John X-Ray Laboratory, Califon, N. J. This bibliography, written by Herbert R. Isenburger and priced at $2, brings up to date the book "Industrial Radiology" published by John Wiley & Sons, New York, in 1943, and the book's first supplement for 1942-1945, published by St. John in 1945.

—o—

An effort to effect a uniformity in the classification and basic welding requirements for piping of the governing agencies in the shipbuilding industry is the reason given by the American Welding Society, New York, for its publication of "Rules for Welding Piping in Marine Construction," Since issuane of the first edition, these rules have represented, according to the society, an agreement among these agencies and the shipbuilders themselves. Two points have been revised, materials and classification of piping, in the book, available from the organization for 25 cents.

How welding simplifies the design of brackets

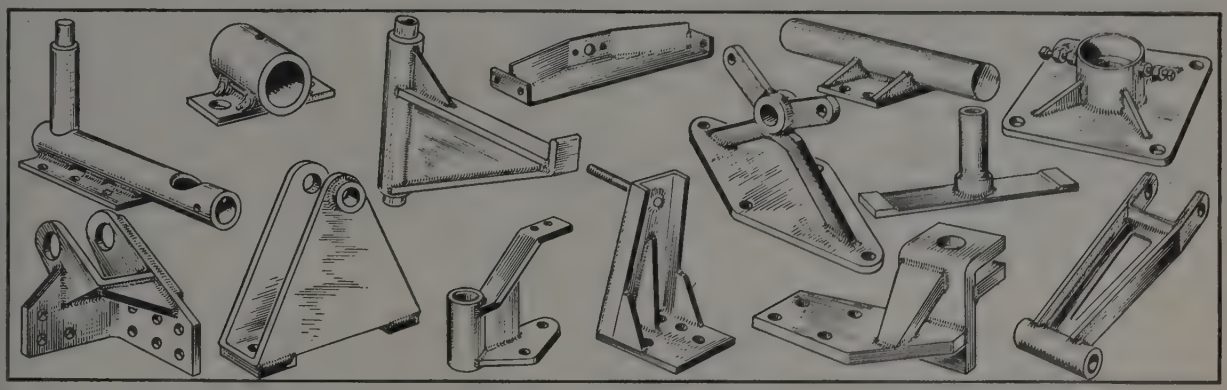


Fig. 1. Typical machinery brackets for various applications *built at lower cost with arc welding.*

WELDING builds all types of component parts, like the brackets shown in Fig. 1 . . . stronger and with less material. Here are several suggestions for building better brackets at lower cost:

Simplest in design are the brackets shown in Fig. 2, made either from separate members or from a single piece sheared and form-bent. For greater rigidity, the cantilever arm can be built from an "I" section (Fig. 3). Two or more of these "I" sections may be placed side by side and butt welded.

Heavy loads are carried with the channel construction shown in Fig. 4. For rigidity and light-weight construction, steel tubing is form-bent and welded to the supporting member (Fig. 5). With tube design, less welding is required.

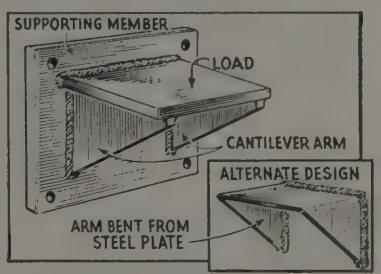


Fig. 2. *Simple bracket design* for normal loading.

Improved product appearance and high product strength are combined by using totally enclosed box-type construction (Fig. 6). Individual parts are fabricated from standard mill shapes or are cut from steel plate.

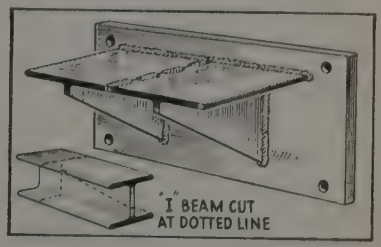


Fig. 3. *Alternate welded design* for low-cost construction. Standard "I" beams are cut and fillet welded to supporting member.

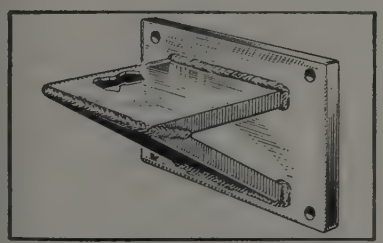


Fig. 4. *For heavy loading,* the cantilever arm is made from channels flame-cut to shape and welded.

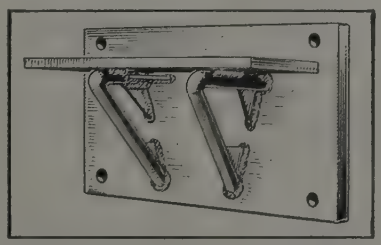


Fig. 5. *Light-weight, rigid construction* uses tubing.

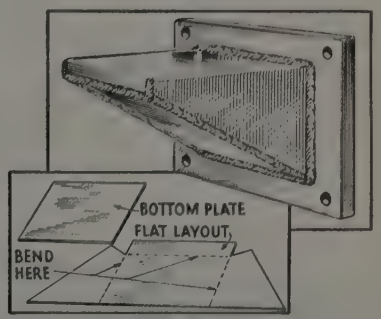


Fig. 6. *Improved product appearance . . .* box-type construction with members sheared, bent to form and welded.

More detailed data on the design of brackets for arc welding is contained in the "Procedure Handbook of Arc Welding Design and Practice." Price $1.50 postpaid in the U. S. A.; elsewhere $2.00.

IRON PRODUCTION INCREASED 38.2%

. . . by improved size preparation and bulk blending of ores

By ROBERT R. WILLIAMS, Jr.
Supt. of Blast Furnaces
Colorado Fuel & Iron Corp.
Pueblo, Colo.

Preparation of ores by means of sizing as mined, screening of an adequate portion for sintering, and blending the crushed oversize in a bedding plant can assure furnace operation of a reasonable degree of regularity in the major portion of the metallic mix

SUBJECT of ore preparation has become one of increasing interest to the iron ore and steel industries, during this period of greater pig iron production requirements. Approach to the subject has been along lines that may be prompted by local conditions but certainly the knowledge of problems confronted, and methods followed in solving these problems in each locality, are of general interest to the industries. Proper sizing, sintering of fines and blending have been most applicable in preparation of ores located in the Rocky Mountain Region.

The Colorado Fuel and Iron Corp. receives its principal supply of iron ore from two sources, the Sunrise mine, located in Platte County, Wyo., about 110 miles north of Cheyenne, and the Iron Mountain Region, some 20 miles southwest of Cedar City, Utah, in the south central part of that state.

Due to the geologic structure of both deposits, ores are quite variable in chemical and physical nature. The Sunrise deposit, lying in a faulted area, is mined by the block-caving method. With a border rock consisting of schists and irregular inclusions of pinite (hydrous silicate of aluminum and potassium) in the ore bodies, the principal variables in the ore are the iron and silica-alumina contents. The Sunrise ore is, for the most part, soft hematite running about 22 per cent minus 80 mesh.

Principal tonnage received to-date from the Utah area has been from the Duncan and Blowout ore bodies. These ores have been subjected to igneous intrusion, and vary from 20 to 100 per cent magnetic. The ores are hard and vary chiefly in iron, silica, sulphur and phosphorus content, and are mined by open pit method.

Prior to installation of the ore preparation plant at Pueblo, lump sizes, excluding the amount required for open hearth ore, were crushed through gyratory type crushers to $-3\frac{1}{2}$ inches, on a car to car basis. The nut sizes were used direct and some percentage of the fines as shipped was sintered over two 42 inch Dwight-Lloyd sintering machines, with a capacity limited to about 15,000 tons per month. Except for small stockpiled surplus, that may have accumulated from time to time, the ores were not brought into

Fig. 1—View of ore bedding and preparation plant referred to in this article

Fig. 2—Flow diagram of ore preparation plant

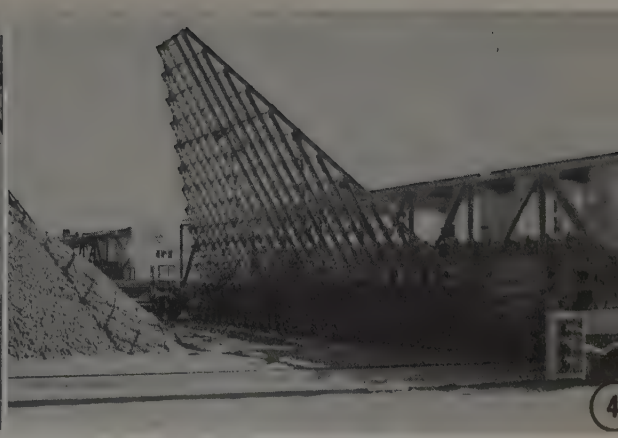


Fig. 3—Double wing stacker showing continuous conveyor belt in left foreground

Fig. 4—Robins-Messiter reclaimer

a common mingling operation, and were used in the blast furnace bins, practically on a car to car basis. They showed wide variations in chemical content, as indicated by carload analyses, accompanied by irregularities in sizing. These variations were thrown directly on the furnaces, with the effect that many burden changes were required, and pig iron produced reflected variations that could not be corrected by operative changes.

Results of a study of conditions that existed in respect to ore handling indicated that more thorough size preparation and bulk blending would materially reduce the variations in furnace operation. Accordingly, design work was begun in 1941 and construction work was completed in September 1943 on an ore preparation plant, consisting essentially of crushing and screening units, sintering facilities, and blending beds.

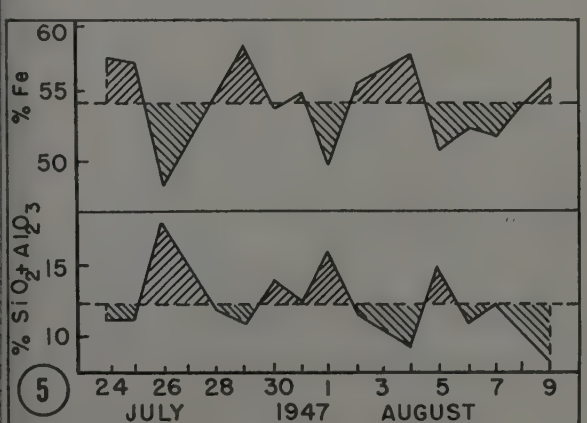
Due to space requirements site chosen for the plant is about 1¼ miles from the blast furnace bins. In addition to providing sufficient space for adequate layout of the units and future expansion possibilities, it has the advantage of being adjacent to the railroad yards, which have continuously served as receiving yards from connecting railroads. Rail transportation is used to direct the blended ore and sinter to blast furnace bins.

To begin flow of materials through the plant, a 25-ton diesel electric locomotive delivers the ore, in open-top railroad cars, onto the cradle of the track level turn-over-type car dumper. Rotating through an angle of 155 degrees, it dumps the ore into a receiving hopper and returns the car to its upright position, after which it is pushed off the cradle by the next loaded car. The receiving hopper is so constructed as to deliver car contents onto an apron feeder. Ore is then fed over a bar grizzly, the oversize passing into a 60 x 48-inch Superior type jaw crusher for primary reduction to about 5-inch size. Undersize from the bar grizzly, together with the crushed ore, are collected under the crusher on a second apron feeder and belt-conveyed to two 5½-foot Symons secondary crushers preceded by scalping screens. These crushers normally reduce the ore size to 2 inches. The crushing operation is completed and the ore is conveyed to a surge bin, from which it is discharged to three 6 x 8-foot Gyrex single-deck screens. Screen size normally in service is ¼ x 3 inches so as to remove undersize ore of minus ¼-inch for the sintering operation. Oversize ore, which is —2 plus ¼-inch is conveyed to the bedding system.

Capacity of the car dumper is approximately 700 net tons per hour. Cycle of dumper operation for raising and lowering the car is 1¼ minutes, based on the handling of free-running ore. This allows about 5 minutes for spotting car on the dumper cradle, cleaning out any ore lodged in the car corners and removing car after dumping. Railroad cars may be handled which have a maximum length of 52 feet, from 6 feet 3 inches to 10 feet 6 inches in height, and from 9 feet to 10 feet 9 inches in width with a maximum gross load

Fig. 5—Daily chemical variations of bedded ores

Fig. 6—Ore variation between beds



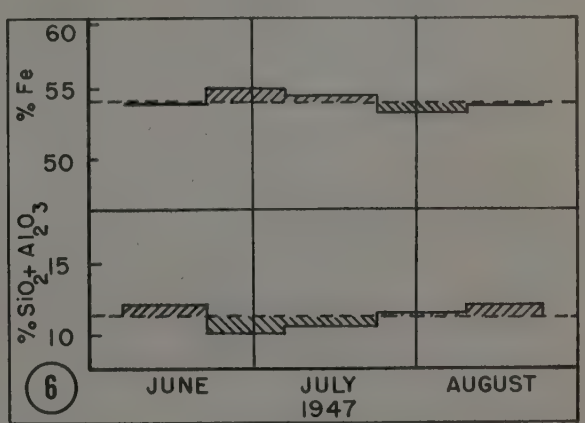


TABLE I
Ores to Beds No. 1 and No. 2, July 24 to Aug. 9, 1947
NATURAL ANALYSIS

Date	Ore	Tons	Fe	SiO_2	Al_2O_3	Cao	MgO	P	S	H_2O
7/24	Sunrise	366	46.0	13.2	3.6	2.5	0.57	0.055	Nil	4.70
	Duncan	644	56.2	6.6	2.4	0.8	0.68	0.103	0.15	3.12
	Blowout	1,171	61.8	5.9	0.9	0.8	0.39	0.099	0.07	1.56
7/25	Sunrise	409	40.9	18.3	7.3	3.5	0.76	0.060	Nil	5.21
	Duncan	555	58.8	6.2	2.1	0.8	0.87	0.079	0.12	2.60
	Blowout	1,290	61.8	6.7	1.2	1.2	0.69	0.107	Nil	1.04
7/26	Sunrise	947	48.7	13.5	3.7	1.5	0.47	0.056	Nil	4.70
	Sunrise	694	42.3	17.6	5.0	2.8	0.66	0.056	Nil	5.73
	Duncan	245	56.0	7.3	3.1	1.1	1.16	0.120	0.14	3.12
7/28	Sunrise	933	49.0	14.0	3.2	1.7	0.48	0.056	Nil	4.17
	Duncan	881	56.8	6.9	1.8	1.0	0.88	0.097	0.14	2.60
	Blowout	382	64.4	6.0	0.8	0.4	0.40	0.057	0.02	0.52
7/29	Sunrise	1,025	51.0	12.6	3.4	1.1	0.48	0.061	Nil	4.17
	Duncan	131	54.9	8.1	3.0	2.1	0.59	0.112	0.15	2.08
	Blowout	1,619	63.3	7.0	0.8	0.6	0.20	0.077	0.02	Nil
7/30	Sunrise	1,322	44.1	16.8	4.4	2.4	0.66	0.063	Nil	4.70
	Duncan	163	56.4	7.2	1.6	1.1	0.78	0.096	0.14	2.08
	Blowout	1,282	63.8	6.9	0.5	0.9	0.50	0.083	Nil	Nil
7/31	Sunrise	1,180	49.4	13.6	3.5	1.3	0.48	0.057	Nil	4.17
	Duncan	332	57.4	6.3	1.9	0.8	0.78	0.097	0.20	2.08
	Blowout	869	61.4	6.7	1.2	1.0	0.40	0.168	Nil	Nil
8/1	Sunrise	428	45.7	15.5	4.2	1.9	1.20	0.057	Nil	3.64
	Sunrise	442	45.8	15.7	4.7	1.7	1.05	0.058	Nil	4.17
	Duncan	472	57.6	6.7	2.1	0.7	1.57	0.090	0.20	2.08
8/2	Sunrise	768	46.6	14.7	3.4	1.6	0.76	0.057	Nil	4.17
	Duncan	331	56.5	7.5	2.4	0.7	1.18	0.100	0.15	2.08
	Blowout	1,077	62.1	7.0	1.0	0.6	0.90	0.124	Nil	Nil
8/4	Sunrise	268	50.0	13.1	3.3	1.2	0.38	0.057	Nil	5.21
	Duncan	667	55.7	8.6	2.8	0.8	0.59	0.121	0.08	2.08
	Blowout	1,113	61.4	6.1	0.7	0.8	0.30	0.166	0.01	1.04
8/5	Sunrise	1,999	49.8	13.4	3.0	1.8	0.60	0.055	Nil	4.17
	Duncan	306	52.0	8.8	1.9	2.4	1.80	0.276	0.25	2.08
	Blowout	235	59.5	7.5	1.3	2.6	0.80	0.143	0.01	0.52
8/6	Sunrise	532	45.7	15.2	4.3	2.4	0.60	0.061	Nil	5.12
	Duncan	325	55.6	7.1	1.3	1.2	1.20	0.111	0.13	3.64
	Duncan	1,741	54.0	6.9	2.1	1.8	1.80	0.274	0.19	2.60
8/7	Sunrise	830	47.2	16.0	3.3	1.2	0.40	0.058	Nil	6.25
	Duncan	296	55.2	7.9	2.2	1.6	1.40	0.134	0.19	2.60
	Duncan	1,736	53.1	8.3	1.8	1.9	1.50	0.235	0.18	2.08
	Blowout	201	57.8	8.1	1.5	1.4	0.70	0.164	0.08	1.04
8/8	Sunrise	729	49.8	13.4	3.0	0.8	0.30	0.057	Nil	5.21
	Duncan	390	56.0	7.1	2.0	1.0	0.80	0.121	0.15	2.60
	Duncan	1,471	55.3	6.9	1.8	1.5	0.90	0.162	0.11	2.08
8/9	Duncan	1,243	55.4	6.6	1.9	1.6	1.40	0.209	0.07	1.04
	Blowout	287	57.6	7.2	1.0	1.1	0.80	0.130	0.08	0.53
Avg. Wtd. Analysis		34,327	54.2	9.9	2.4	1.4	0.77	0.111	0.054	2.68

of 210,000 pounds. Crushers and screening system will handle the dumping capacity of 700 net tons per hour, provided the ore is running approximately 50 per cent fines and 50 per cent coarse ore. Slight variations arise from time to time as a result of handling ore that has previously been screened at the mines.

Sintering plant proper consists of two Dwight-Lloyd sintering machines each 72 inches wide and 102 feet long. Sintering plant bin system is located adjacent and parallel to the sintering plant building, and consists of a long storage bin for ore fines and four bins for prepared coke breeze. The ore bin has a capacity of about 3000 net tons, and each coke breeze bin will hold about 90 net tons. Bottom of the ore storage bin is constructed with a shelf. Ore is removed from the shelf by means of a rotary plow feeder, consisting of a four-vaned plow, operating in a horizontal plane. It is mounted on a traveling carriage which moves back and forth in front of the shelf and feeds the material from the shelf in regulated amount to the collecting conveyor, located in front and below the shelf. The collecting conveyor feeds a surge bin located over two table feeds. A table feeder is located directly under each of the coke breeze bins. All tables are individually driven by variable speed motors, controlled from the burner floor. Sinter returns are fed by vibrating feeders directly from return bins at discharge end of the sintering machines. Sintering mix is conveyed by a common conveyor, located between the two suction mains, to a super hopper over the pug mills. Rotary drum type pug mills 5 feet in diameter and 9 feet in length are in use. Conventional swinging spouts, cutoff plates and American ore burners are used at the feed end of sintering machines. The machines are equipped with dust hoods over approximately one-half of the bed length. Double vertical-inlet type fans, having a capacity of 137,000 cubic feet per minute of air at 250° F, are protected by centrifugal dust collectors.

A sinter discharge chute connects to the discharge and castings of the sintering machine to form a housing for the sinter return grizzly, which directs oversize of finished sinter to the sinter wharf. A sinter crusher or breaker is provided in the lower section of the return grizzly of each machine in order to control sinter size for belt handling. Quenching is accomplished on the wharf and sinter is fed to a collecting belt in the same manner and by a similar rotary plow as is used at the bottom of the fine ore bin. Two subsequent belts direct sinter to a loading station, where it is loaded in railroad cars for use at the furnace bins. An alternate system provides for the sinter to be directed with the coarse ore to the beds.

Coke breeze for the sintering operation is prepared in a system consisting of an unloading track hopper, two 5 x 12-foot Gyrex single deck screens, and a 6 x 12-foot Marcy Rod Mill in a closed circuit with the screens. Screen size is maintained at ⅛ x 3 inches. Prepared coke breeze is conveyed to storage bins over the same system that handles the fine ore, and the system is limited to off-turn operation.

There are four beds on which ore may be blended. Normal practice is to use two beds for stacking while reclaiming from the two remaining beds. Two field belts are required for the stacking operation, and a trailer tripper is permanently engaged in each of these belts. A double wing stacker is coupled to a trailer tripper, and the composite unit is traversed at speeds of about 60 or 110 feet per minute, dependent on the direction of traverse with respect to direction of belt movement. This traverse is back and forth along the beds, with automatic reversal of direction. Thus, many thin layers of ore, one over the other, are placed on the beds to form a pile triangular in cross section, about 50 feet at the base, 18 feet in height and 560 feet in length. Each bed will hold approximately 17,000 net tons of ore when filled.

The reclaiming operation is performed by Robins-Messiter reclaiming machines, illustrated in Fig. 4. Each machine is essentially a traveling bridge, 75 feet center to center of rails, spanning the width of the ore bed and a trench conveyer. A harrow, adjustable for slope and triangular in shape to cover the bed cross section, is mounted on the front end of the bridge structure, and is a structural steel grid frame with vertical and horizontal members spaced about 2 feet apart. Vertical members are provided with harrow teeth closely spaced. A reciprocating motion is imparted to the harrow by means of a connecting rod and crank; the crank disk being mounted on an extension of the plow conveyor drive shaft to co-ordinate functioning of these two units. A reversible plow conveyor is suspended under the forward side of the main bridge structure, consisting of a single strand of steel bar chain to which are attached the plows. The lower strand of the chain operates in a steel trough to carry dislodged ore to one or the other end of the machine for discharge to a trench con-

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TABLE II

RECORD OF BLENDED ORES—1947

Bed Nos.	Stacked	Re-claimed	—Material in Beds— Ores	Tons	Per Cent	Analysis—Natural Fe	SiO_2	Al_2O_3	CaO	MgO	P	S	Moist
1	May 21	June 5	Sunrise	12,779	40.4								
and	to	to	Duncan	1,715	5.4								
2	June 5	June 21	Blowout	17,152	54.2								
				31,646	100.0	54.11	9.50	2.49	1.66	0.67	0.110	0.039	3.26
3	June 5	June 21	Sunrise	14,068	39.4								
and	to	to	Duncan	2,629	7.4								
4	June 21	July 5	Blowout	18,952	53.2								
				35,669	100.0	55.1	8.27	2.04	1.48	0.52	0.071	0.017	3.28
1	June 21	July 5	Sunrise	11,937	34.5								
and	to	to	Duncan	18,231	52.8								
2	July 5	July 23	Blowout	4,392	12.7								
				34,560	100.0	54.5	8.62	2.28	1.69	0.81	0.106	0.011	3.05
3	July 7	July 24	Sunrise	13,471	38.0								
and	to	to	Duncan	9,362	26.4								
4	July 23	Aug. 9	Blowout	12,633	35.6								
				35,466	100.0	53.5	9.28	2.28	1.67	0.67	0.127	0.037	2.71
1	July 24	Aug. 9	Sunrise	12,872	37.5								
and	to	to	Duncan	11,929	34.8								
2	Aug. 9	Aug. 22	Blowout	9,526	27.7								
				34,327	100.0	54.2	9.90	2.41	1.37	0.77	0.111	0.054	2.68

veyor. Subsequently it is carried by two belts to the ore loading station, where it is loaded in railroad cars for the furnace bins.

A self-propelled transfer car, located in a shallow pit at one end of the bedding area, is used to transfer the reclaiming machines from pile to pile and also to transfer the double-wing stacker from one stacking conveyor to another.

Capacity of the system handling coarse ore to the beds is about 450 net tons per hour. Provision is also made for handling of 125 net tons per hour of sinter to the beds, should it be desirable to bed this material. The capacity of the system handling ore reclaimed from the beds is 800 net tons per hour. This capacity is reached when two machines are in operation, each machine being capable of reclaiming at a rate of 400 net tons per hour.

A weightometer is installed in the system between primary and secondary crushers for the purpose of checking total weight of material into the plant. Also, a similar weightometer is in the system between final ore screens and field stacker belts handling coarse ore to the beds. From these two weightometer readings, amount of fine ore to the sintering plant bins may be calculated. A third weightometer in the sinter-handling system gives a check on car weights of that material.

Complete sampling units are installed in the system handling the coarse ore to the beds and in the sinter-handling system. In each system a Geary-Jennings sampler is provided to remove the initial sample. This is riffled, one-half returned to the stream and one-half delivered into a crusher for reduction to a half-inch product, which is then elevated in a bucket elevator to such height as to permit a secondary sampling and riffling operation, with extracted samples being collected in sample boxes, and surplus being returned to the flow of original material. It is possible to control the sampler to give a sample at from 1 to 17 minutes in ½-minute increments. Primary samplers only are installed in the system from secondary crushers to the final ore screening station, and in the system handling ore from the beds. The latter devices are manually operated, and samples must be transported for further reduction.

In addition to installation of the ore preparation plant at Pueblo, we commissioned a new shaft and screening facilities at the Sunrise mine in 1945. Sizing of ore had been conducted for a period of years at a remote screening station on the mining property. Purpose of such sizing was to facilitate unloading operations and permit direct charging of nut sizes and sintering of fine ores at the old Pueblo sintering plant. Experience gained in these operations prompted the installation of additional hand picking facilities in conjunction with the new screening station. Such hand-picking, under convenient arrangements, may be conducted economically, and removal of rock to the extent of from 3 to 4 per cent of the lump and nut sizes accounts for a reduction of 1½ to 2 per cent insoluble material in ores of plus 2-inch size.

Consumption of open hearth charge and feed ore amounts to some 6000 to 8000 tons per month and is obtained from sizing facilities at the Sunrise screening station. This ore, being —12 plus 5 inches in size, is easily selected and picked for rock content, and affords a desirable material for open hearth use. Softer ore of the Sunrise deposit is more satisfactory for charge ore than is Utah ore. Although the Pueblo ore preparation plant is designed for direct loading of sinter, whereby tonnages might be prepared for open hearth use, it is not likely that sinter will be made for this purpose.

Sampling equipment, previously described, provides for automatic samples to be taken out of coarse ore going into the beds, and a very minimum of labor is required to prepare this sample for chemical anaylsis.

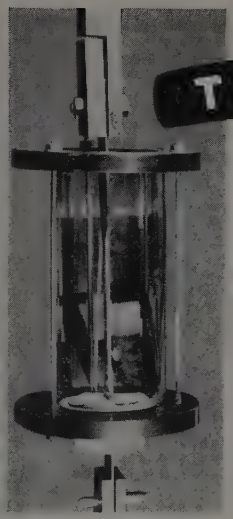
By weighing daily analyses against the respective tonnages to the beds, it is possible to obtain an analysis of completed beds prior to the time ore is to be reclaimed for furnace use.

Table I shows daily analyses and respective tonnages of ores to the beds for the period July 24 to Aug. 9, 1947, during which time 34,927 net tons of ore were stacked in beds numbers 1 and 2. Inspection of figures set forth indicate that iron varies from a low of 40.9 per cent to a high of 64.4 per cent, or 23.5 per cent; silica from 6.1 to 16.8 per cent, or 10.7 per cent; alumina from 0.80 to 7.30 per cent, or 6.50 per cent; lime from 0.40 to 2.60 per cent, or 2.20 per cent; magnesia from 0.30 to 1.80 per cent, or 1.50 per cent; phosphorus from 0.055 to 0.274 per cent or 0.219 per cent; and sulphur from nil to 0.25 per cent, or 0.25 per cent. These variations are for quantities of not less than 131 tons and as much as 1,999 tons, and are typical of daily variations in stock that was charged direct to the furnaces, prior to use of the preparation plant.

Daily variations in Fe and SiO_2 plus Al_2O_3 content of the ores into the bedding plant are graphically set forth in Figure 5. Here analyses are considered on an average daily basis, and do not take into account extreme variations that occur during any single day.

The calculated number of round trips that the stacker made in stacking beds numbers 1 and 2, with an average continuous flow of 300 net tons per hour of coarse ore to the beds, is 521. There are, then, 1042 layers in each of the beds and they are cut through in nearly a vertical plane in reclaiming the ore. Further calculations indicate that only 20 inches of horizontal travel of the reclaiming machine through each of the 1042 layers is required to load one standard 50-ton railroad car. Such intimate mechanical mingling of the ores is a challenge to the most pains-

(*Please turn to Page* 136)



TESTING

STRESS-CORROSION RESISTANCE

Of Aluminum Alloys

DEVELOPMENT of high-strength aluminum alloys for use in larger, heavier and faster aircraft brings new testing problems to the National Bureau of Standards. The procedures used for testing several aluminum alloys introduced during the recent war—namely, 75S-T, R-301-T, R303-T and artificially aged 24S-T—to determine their ability to withstand the highly corrosive conditions of the tropics are indicative of the Bureau's exhaustive explorations.

Tests were conducted in three ways: Marine-atmosphere exposure, under stress immersed in a sodium chloride-hydrogen peroxide solution, and under stress in a boiling 6 per cent solution of sodium chloride, the latter test being used only on those alloys containing zinc (R303-T and 75S-T). Unstressed specimens were subjected to the same corrosive conditions in order that the effect of stress in increasing corrosion damage could be evaluated.

In the investigations of stress-corrosion resistance of the new materials, flat tensile specimens with ½-inch reduced sections were used under a stress equal to three-fourths of the yield strength. All clad materials were tested with the cladding intact since determination of the alloy's resistance rather than that of the core material was the purpose of the tests. Losses in ultimate tensile strength and per cent elongation were taken as criteria of corrosion damage.

Specimens supported vertically and stressed by means of weighted levers were tested in the sodium chloride-hydrogen peroxide solution (NaCl, 57 g; 30-per cent H_2O_2, 10 ml; H_2O, 990 ml), with samples up to 0.064-inch in thickness kept immersed for 24 hours. One-eighth-inch specimens were immersed for 72 hours, the solution being renewed every 24 hours.

Time of Failure Recorded—Fig. 1 shows part of the apparatus used in these tests. Pyrex cylindrical tubes fitted at each end with slotted bakelite disks held the corrosive solution, rubber gaskets between the bakelite and the glass, and rubber stoppers with rectangular slots slightly smaller than the grip end of the specimens

Fig. 1—Stressed aluminum alloy specimens were immersed in a sodium chloride-hydrogen peroxide solution in these cells as part of the tests for corrosion resistance

Fig. 2—Marine-atmosphere exposure tests were conducted in this apparatus at Hampton Roads, Va.

completing the test cell assembly. Breaking of a specimen under stress automatically opened a knife switch in the circuit of a solenoid counter, thus recording the time required for failure of the specimen in units of one-tenth of an hour. Specimens were broken in a hydraulic-type tensile testing machine after removal from the solution to determine the tensile properties of the corroded materials. Metallographic examinations were also made to determine the types of corrosion that had developed. For marine-atmosphere exposure tests, the specimens were supported and stressed in a similar fashion (Fig. 2) but then they were left exposed to the air.

Specimens immersed in boiling sodium chloride solution were stressed by bowing, a threaded Monel rod with insulating washers slotted to hold the ends of the specimen and two nuts to provide tension being used. Wide mounted flasks connected to reflux condensers held the solution and the specimens as shown in Fig. 3.

After remaining in the boiling solution for 14 days (unless earlier failures occurred), the specimens were removed, cleaned and broken in tensile tests.

To measure the distance from the chord connecting the outer ends of the specimen and the outer fiber of the specimen, a device capable of measuring 0.0001 inch was devised, the reading being given on a dial gage.

Aging Strengthens Material — The results of the investigation indicate that flat, bare 24S-T aluminum alloy sheet aged four hours or longer at 375 degrees F is not susceptible to stress-corrosion cracking in either the laboratory or marine atmosphere tests, and is at least as resistant to the combined action of stress and corrosion as the commercially heat-treated but unaged material. It was found that aging of a sample of this alloy for three hours at 385 degrees F produced an increase in yield strength of about 25 per cent above an initial value of approximately 50,000 pounds per square inch, an increase in tensile strength of about 3 per cent above an initial value of approximately 70,000 pounds per square inch, and a decrease of about two-thirds in the initial elongation of 17 to 18 per cent. Similar results were obtained when the material was aged for 20 hours at 350 degrees F, five hours at 375 degrees F, or 1½ hours at 400 degrees F.

The samples of the other alloys that were tested with the exception of R301-T, were found adequately resistant to stress-corrosion cracking. The failure of the R301-T samples was the result of the penetration of stress-corrosion into the core material at the machined edges of the relatively narrow (½-inch wide) specimens that were tested. Such damage would probably not be significant in wide sheets, particularly those cut by shearing.

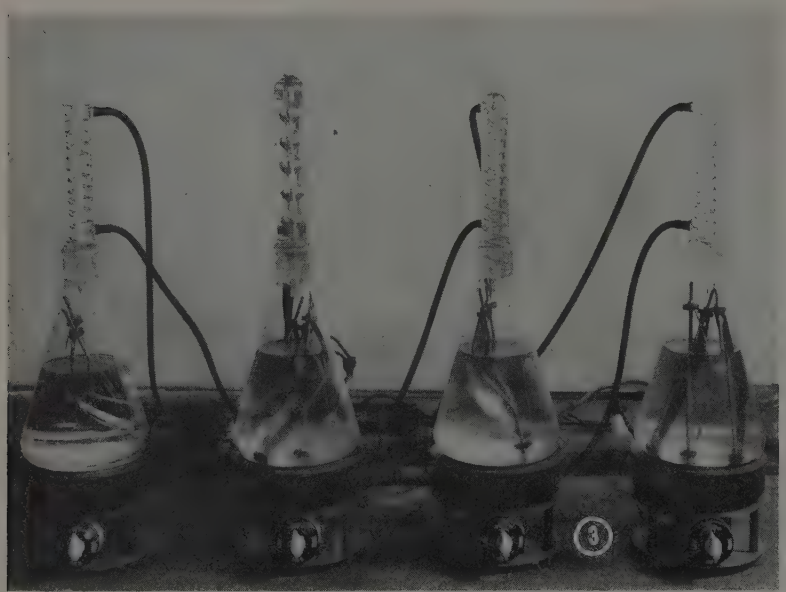


Fig. 3—Zinc-bearing aluminum specimens were subjected to boiling sodium-chloride solution in this test. Stress was applied by bowing the specimens

Hot Rolled Rail Steel Bar Standard Adopted

Effective for new production from October 20, 1948, is a newly established commercial standard CS150-48 for hot rolled rail steel bars produced from T-section rails, according to the National Bureau of Standards, Washington. Since the submission of a recommended commercial standard proposed by manufacturers and other interests has been accepted by a sufficient number of producers, distributors and users, it has been put into effect.

Standard provides for one quality of steel bars giving strength, dimensions and manufacturing tolerances for rounds, squares, octagons, diamonds, ovals, triangles, angles, flats and bands. The printed edition of the standard is available from Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents per copy.

Development Increases Gas Engine Power

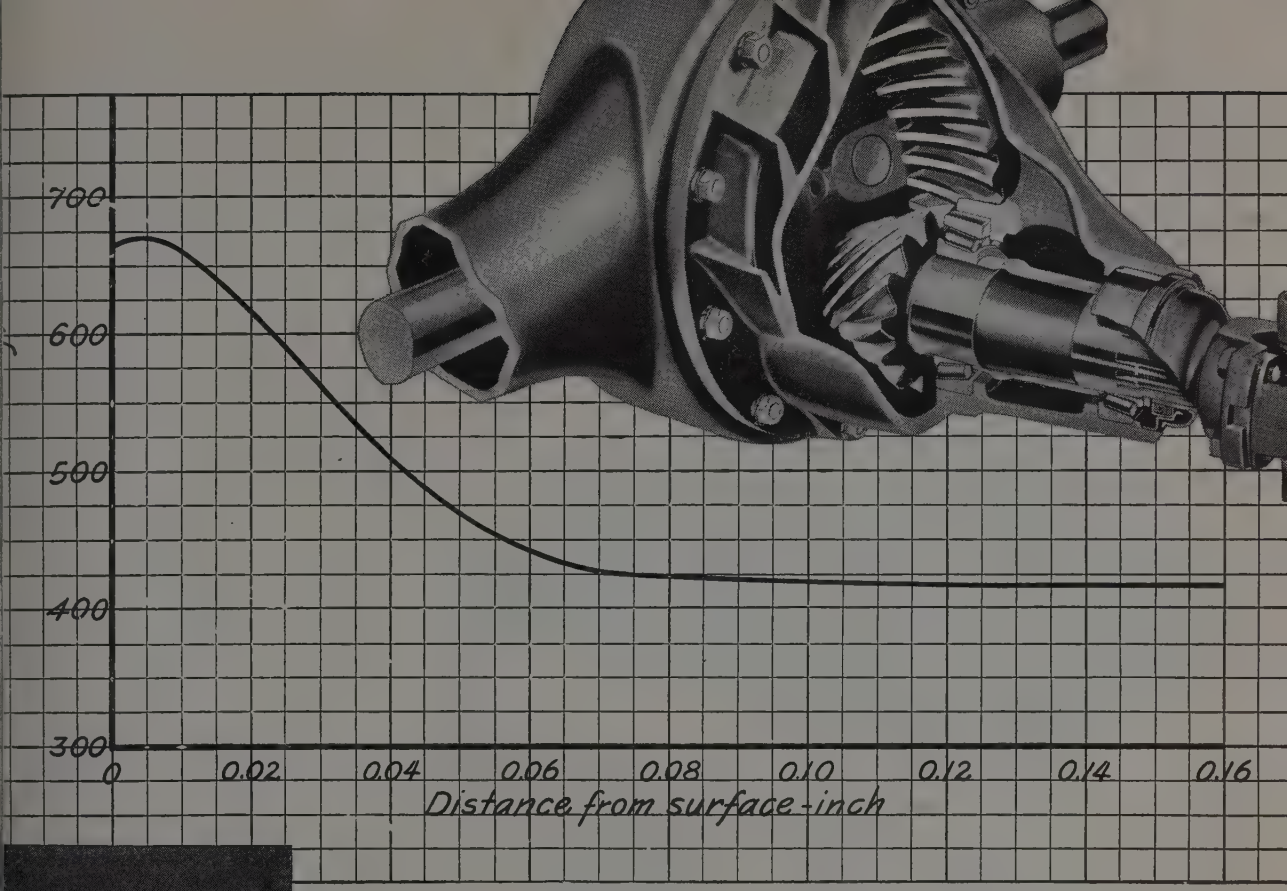
Fuel costs are cut by at least 20 per cent and power is said to be increased by 14 per cent with the application of the Turboflow development to 4-cycle gas engines, states Cooper-Bessemer Corp., Mount Vernon, O. First announcement of the development was made by the company about a year ago in connection with the 2-cycle gas engine, but this is said to be the first time the principle has been applied to the widely used 4-cycle engine.

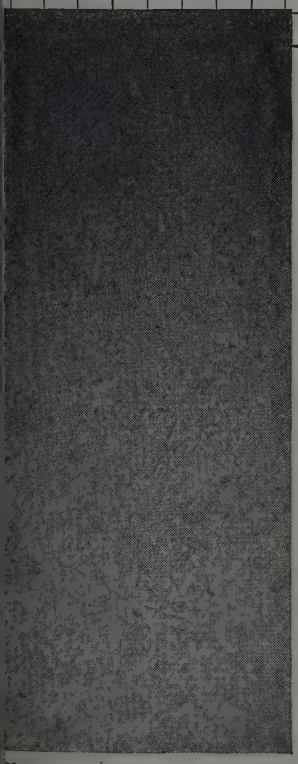
Using the Turboflow, the standard fuel mixing valve is discarded in favor of a simple gas injection system similar to that used on the company's atmospheric gas-diesel engines. Compared with the gas-diesel, the Turboflow is said to be a close second in operational efficiency.

—o—

Reclamation of scrapped die punches is possible through a new service offered by An-Dean Mfg. Co., Inwood, Ind., in which the die punches are tipped and centered. Rockwell hardness is retained.

Punches salvaged by this method can be ground down for use in making smaller diameter holes than those of the original punch.





Photomicrograph (100x) and hardness penetration graph of Chromium-Vanadium A 6120 steel, with a light case (0.80–0.85% carbon) in outer .010 inch.

BONDED FOR LONGER LIFE

The secret of the outstanding strength of carburized parts made of Chromium-Vanadium A 6120 steel is revealed in the above chart. The noteworthy feature is the even slope of the curve, representing the *gradual* decrease in carbon penetration.

There is no sharp dividing line between the case and core—no shell to be shattered by shock or repeated stress. On the contrary, Chromium-Vanadium A 6120 carburizing steel is notable for the firm, well-integrated bond which results from the characteristically uniform decrease in hardness penetration from case to core.

The accompanying photomicrograph is further convincing proof of this exceptional integration or bonding.

For such vital parts as gears, cams, splines, shafts and bearings, the use of A 6120 Chromium-Vanadium carburizing steel assures superior performance and longer service life, in addition to over-all economy.

Our metallurgists will be glad to work with you on your carburizing problems.

VANADIUM CORPORATION OF AMERICA

420 LEXINGTON AVENUE, NEW YORK 17, N.Y. • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

Creation of a Fastener

(*Concluded from Page 94*)

furnace which contains a reciprocating muffle which is constantly jiggling parts toward the discharge end of the furnace. It takes approximately 2½ to 3 minutes at a temperature of 1575° F for the part to travel the entire length of the furnace. At the discharge end of the furnace fasteners fall into a bath of quenching oil and are hardened. After another cleaning, they are drawn to a spring temper, rockwell hardness 46-48—"C" scale in Eclipse and Lindberg homo-type furnaces for 45 minutes at 720° F.

Parts are then placed in baskets containing from 150 to 250 pounds and are dipped in a parkerizing solution, a phosphate coating, being imparted during the 15 to 20 minute immersion at 180 to 190° F. This coating provides the bond for the Glidden zinc chromate paint used to finish the part. After Parkerizing, parts are rinsed in clear water several times at 190 to 200° F. A third tank containing a chromic acid solution is used for neutralizing the phosphating reaction.

Next a centrifugal hot air dryer is used to spin the parts completely dry during a two to three minute cycle. After this, material is routed to a Ronci paint machine which paints the part with a dull green color zinc chromate paint and spins off all excess paint. Material is then placed in basket-type trays with mesh bottoms and placed in gas-fired drying and baking ovens built by George Koch & Sons Co. Held at a temperature of 250 to 300° F for 15 to 20 minutes, the part receives its final finish. The same cycle is utilized for the second and third painting if such coats are to be given. This type paint is used because it affords better corrosion resistant powers and makes for complete absence of any hydrogen embrittlement in the finished fastener.

Throughout all the above operations, parts are constantly subject to thorough inspection and test as the slightest deviation from standard in the finished unit would render them totally inadequate for the job which they were designed to perform.

—o—

R. G. LeTourneau Inc., Peoria, Ill., is manufacturing a model D Roadster Tournapull, a new small unit for production earthmoving on small yardage projects. The self-loading, one-man-operated E-9 Carryall scraper of 9 ton or 7 cubic yard capacity is pulled by a 100-horsepower diesel or gas engine.

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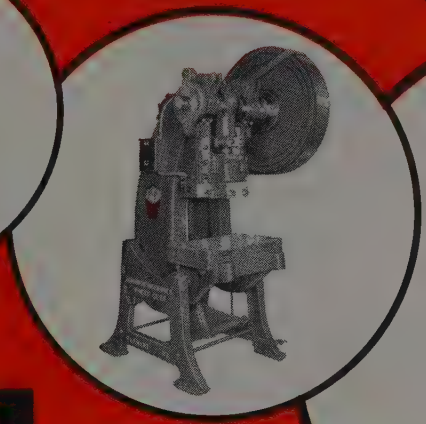
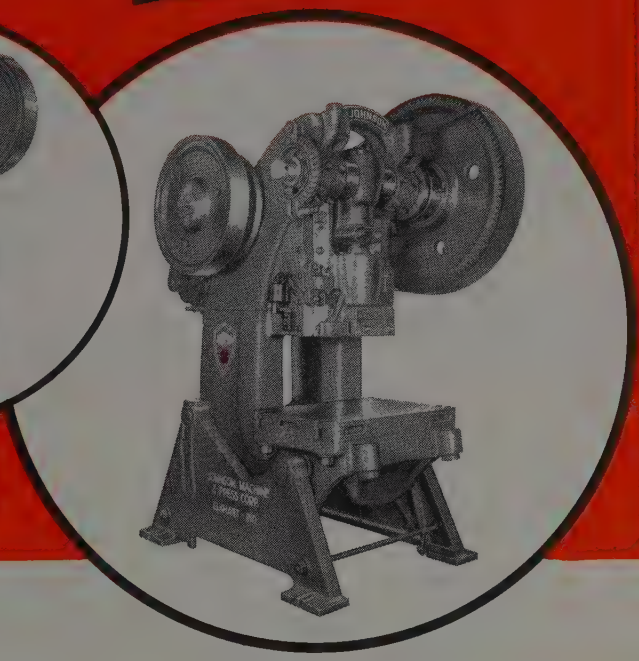
to punch, draw, pierce, form, size, trim, coin or assemble

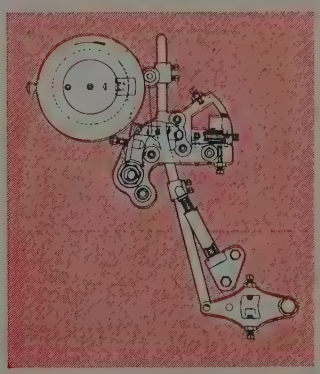
the press you need is a Johnson





CAPACITIES
16 TO 90 TONS

Extra die space on the Johnson Inclinable Power Press makes it possible to put bigger jobs on the smaller presses. ***Every Johnson unit*** is built to make maintenance easy. ***The exploded view*** at left shows standard parts and their simplified assembly. ***For extra safety,*** Johnson Presses have a patented non-repeat tripping device, activated by two springs. If the first spring breaks, the second takes over. Should the second spring fail, the pedal automatically stays down. Diagram at the right shows husky construction. ***Springs can be replaced*** in 30 seconds without stopping the machine. ***There's a Johnson Press*** to solve your problems of diverse production with minimum equipment. Get the facts.



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JOHNSON *Machine and Press Corp.*

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Forging Practice

(*Continued from Page* 100)

forging dies for making drop forgings with ribs or thin sections are just the opposite of the die conditions where high plugs are in the dies. Thin ribs require thin slots in the dies; the hot plastic metal must be forced into these thin slots to form the thin rib. Naturally, contact of a small amount of hot metal with a die that is so much colder, will tend to cool the metal very fast at the place where it is trying to work itself into the thin slot. The cooling action to the metal at the point of the thin slot in the die slows up the metal movement into the thin slot.

Then more impact force is required to work the metal into the die slot, resulting in faster wear on the die impression at that point. Sometimes the metal tends to cool off with sufficient speed that it will not fill the thin slot part of the die impression, and this results in a drop forging that is not filled out completely. It is always desirable to make the rib or thin section as wide as possible and to make connecting radii as big as possible so as to permit the plastic metal to move with greater ease into the die slots.

Fig. 80 shows good and poor design on the I-beam section of a connecting rod. Note the sweeps in the improved design. It is not always possible to make radii, corners, and fillets as large as desired, and modern forging practice permits the making of difficult or even some so-called "impossible" shapes. But it is certain that any aid in the design of a drop forging in making radii and corners as large as the design will permit, will pay dividends in obtaining a drop forging that is more satisfactory and economical.

Bosses and Stems — Bosses and stems are often on the drop forging and they are usually considered as projections extending away from the main body of the forging. The addition of draft to the bosses depends upon their position with relation to the main body of the forging and upon the method of applying the parting plane. If the boss is in a vertical position with relation to the parting plane, the usual draft is added to all sides of the boss. If the boss is in a plane parallel to the die parting plane, only end draft need be added. When the boss or projection is in the center of a round forging, such as in a gear blank, the boss is usually called a hub.

Tolerances—Tolerances are essential to all practical manufacturing processes. Design of a mechanical device requires the detail designing

of all of its parts, or components, and basic dimensions must be given to all sections of each part. Design must also indicate closeness with which each part must fit in relation to all the other parts. It is not possible, for practical purposes, to forge, machine, or grind each and every part to exact dimensions. The tolerance indicates the permissible deviation or variation from the true and exact dimension.

Tolerances may be close or they may be broad, depending upon the requirements of the part. On forgings, or on machine work, it should be understood that as the tolerances become smaller, the cost of the part becomes more expensive. Therefore, in placing tolerances on drop forgings, the tolerances should be as large as the function of the part will permit. For example, in forging a bumper jack handle, or a jack base, the tolerances need not be exact. The handle can be 1/2-inch longer than the given dimension without affecting its use, or its ability to be put away in the automobile tool compartment. The jack base can be plus or minus ⅛-inch without affecting its function as a jack base. It would be costly to specify a tolerance of plus or minus 0.005-in. on those parts, without receiving value.

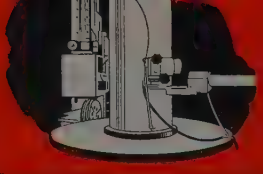
However, in selecting six connecting rods for use in the automobile motor, it is important to specify very close tolerance on important dimensions and on weight for the six connecting rods, since good balance is necessary in a smooth running motor. Close tolerances are necessary for some applications and large tolerances can be used for other applications. The designing engineer should specify tolerances close enough so that the part can serve its function properly, but any tolerance that is closer than necessary will add to the dificulty in maintaining the tolerance, and add to the cost, without serving any useful purpose. Drop forging tolerances are outlined in a booklet issued by the Drop Forging Association, Cleveland. The booklet is entitled, "Standard Practices and Tolerances for Impresion Die Forgings". The practices and tolerances suggested in the booklet serve as a standard guide but do not preclude special tolerance agreements in special cases.

(To be continued)

—o—

Liners for steel drums, consisting of Pliofilm or Polyethylene and X-Crepe, a paper product giving the plastic film support, are being manufactured by Cincinnati Industries Inc., Cincinnati, as a means of alleviating the steel drum shortage.

For **LONGITUDINAL SEAMS** —tanks, pipe welding, housings, automotive frames, etc.



For **CIRCUMFERENTIAL SEAMS** —tanks, pressure vessels, machinery parts

For **CONTINUOUS WELDS** —spiral welded pipe, tubing, cylindrical structures.

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WELDOMATIC WELDING HEAD: Automatically strikes the arc—feeds electrode to work at a continuous and accurately controlled rate.

CONTROL EQUIPMENT: All operating controls in one location. Single dial adjusts arc length and electrode feed—inching device facilitates adjustment between electrode and work. Remote control initiates relative motion between electrode and part to be welded.

WELDING POWER SUPPLY: Standard ratings of 500, 750, 1000 and 1500-ampere Flexarc A-C Welders are available for a-c operations. Flexarc M-G sets may be substituted for d-c applications.

POSITIONER: Work positioning and handling equipment of standard or special design is supplied to meet specific requirements.

Photo (left) shows Westinghouse Weldomatic Welder in operation, welding bearing housing to a motor end-bracket. Inset shows smooth, uniform weld resulting.

WESTINGHOUSE

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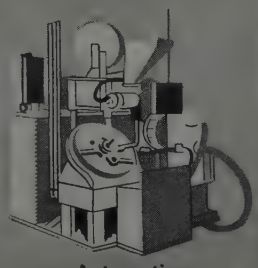
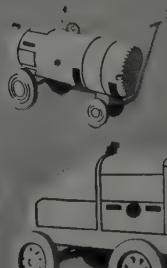
Manual Type A-C Welders
HC, WC-AC, WT-4 Farm Welder

1000 Amp
A-C Welder

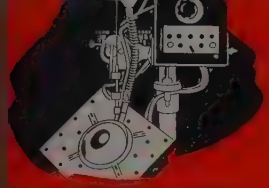


Automatic
Welding Equipment

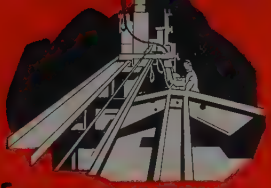


Single Ope
D-C Welc

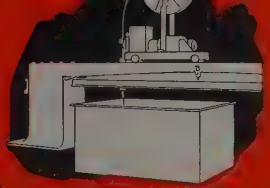
Engine
D-C W



or REPETITIVE JOINING
assemblies involving identi-
l operations, etc.



For LARGE STRUCTURES
—girders, center sills, ship
plating, etc.



For THIN METAL STRUCTURES
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Automatic welding today is solving more and ore metal-joining problems, from the smallest t parts to heavy assemblies. Westinghouse now akes it easy to apply this time and cost-saving rocess, with the first and only complete "package" f equipment built, sold and installed as a unit.

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Universal operation of Westinghouse automatic elding equipment permits a choice of power, pplied by either a Flexarc Transformer Welder r a-c or by a Flexarc M-G set for d-c operation. Vork positioning and handling equipment of andard or special design is supplied to meet the pecific requirements of the job and completely stalled, ready to operate.

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FASTER: Ease in using heavier electrodes with higher currents, and the ability to make excellent welds in all positions assure higher speeds on all classes of work.

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BETTER: Westinghouse A-C Welders eliminate magnetic arc blow—reduce spatter loss—permit welding of heavier sections—assure easy arc control and sounder welds.

Investigate Flexarc A-C Welders today—your Westinghouse representative can give you unbiased counsel on *any* metal-joining process.

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Welding Equipment—also on items checked.

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Name_____

Company_____

Address_____

Wire Drawing Speed

(*Concluded from Page* 102)

ively rustproofed with the new phosphate compound. Sulphiding trouble was practically eliminated. Draw bench operators said wire which had been dipped for 2 minutes in a 1 per cent solution and rinsed in hot water, drew out more smoothly and rode up the block much better.

The coating deposited is an amorphous or non-crystalline phosphate with a physical structure much like that of high-polymer resins. It follows the profile of the metal surface in an even and continuous film approximately 15 millionths of an inch thick, imparting no roughness and retaining its flexibility so that it does not crack or flake in further processing of the wire or other metal product or part. Heat is not required for application—an advantage to manufacturers faced with fuel shortages—nor is special equipment. Both spray and immersion methods are being employed at present. A maintenance problem common to some phosphate coating solutions is eliminated because the compound does not produce sludge in the tank.

Silicone Rubber Qualities Bring About Wide Usage

Silicone rubber, looking and in many ways acting like conventional rubber, retains its rubber-like qualities and elasticity at extreme temperatures (—150 to 500° F). In addition to being suitable for dielectric applications, silicone rubber parts are resistant to permanent compression even under extreme heat, and withstand prolonged weathering.

According to Stalwart Rubber Co. Bedford, O., producer of silicone rubber products in a variety of shapes and sizes, the new material is suitable for use in handling of hot and cold fluids, gases and in products such as industrial ovens, steam generators, gas cylinders, oil burners, electrical heating equipment, electric motors, transformers and die casting machines. It is said that the rubber will not become hard or brittle after long exposure to air, ultraviolet rays or ozone.

—o—

The story of one hundred years of locomotive manufacturing at Schenectady, N. Y., is covered in a 48-page illustrated booklet, "Growing With Schenectady," published by American Locomotive Co. History of the company from the proposal to buy the land for the first factory through the recent decision to concentrate on building diesel locomotives only is covered in the booklet.

Lubricating Open Gears

(*Concluded from Page* 109)

cause of inadequate protection by the buildings.

Resistance to heat is such that detrimental softening or drippage has not occurred on steel plant table roller gears and similar service during extremely hot weather or high temperature mill conditions. Operations for three days or more have been common with such applications.

Performance in cold weather service has been unusual in that the lubricant does not crack or break away from metal to as low as minus 40° F.

With the high adhesiveness and extremely high film strength, this lubricant has extended gear life where incorrect alignment prevents line contact of teeth surfaces. Such a condition develops a degree of point contact or high pressure area where the maximum in film strength has proved beneficial in prevention of metal-to-metal contact.

Mill pinions with bearings not equipped with seals usually require a tacky type lubricant for splash or dip lubrication of the teeth. Losses through the bearing openings are excessive and bearing lubrication is not efficient unless plastics or greases are used for hand packing and neck lubrication. Substitution with this improved lubricant has extended pinion service, provided cushioning to eliminate roll chatter, offered adequate bearing lubrication and developed negligible make-up requirements.

Enclosed gears with cracked or leaking gear cases are costly to lubricate because of excessive losses. Use of the improved lubricant alleviated this condition in providing a lubricant with fluidity but one which air hardens at the points of leakage. Gearing in outside service subject to the weather elements and corrosive vapors, but particularly those in intermittent service or in long standby periods requires a lubricant film as protection against corrosion. This lubricant with the inherent paint-like film is designed to meet such conditions.

—o—

Revised list A of current publications on nickel alloy steels, nickel cast iron, nickel brass and bronzes and nickel plating is available from International Nickel Co. Inc., New York. Publications offered cover the production, fabrication, properties and uses of nickel alloys for industrial applications, and the production, properties and use of nickel electrodeposits.

Iron Production Increases

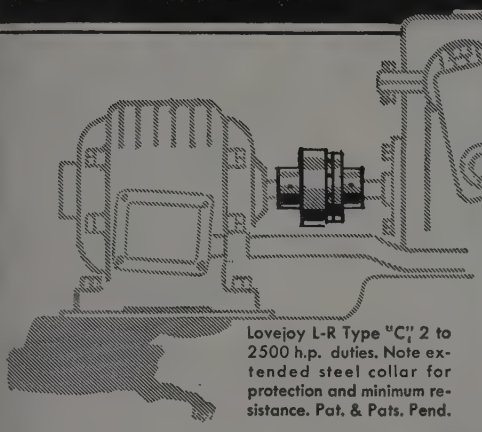
(*Continued from Page* 118)

taking sampling method that might be applied to the out-bound blend ore.

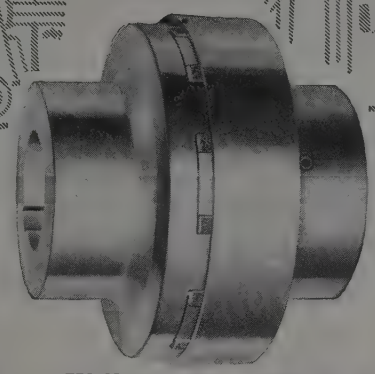
As a matter of obtaining some idea of regularity of the ore coming from the beds, a test was conducted between March 8 and 14, 1948, as ore was being reclaimed from bed No. 2. Ore into the bed had shown daily variations in Fe of from 43.0 to 57.3 per cent and in SiO_2 of from 9.5 to 20.1 per cent, and the bed contained 15,571 net tons of ore averaging 53.6 per cent Fe and 13.0 per cent SiO_2 on a dry basis. A series of 197 samples, taken at intervals closely approximating one sample per 70 ton carload by a Geary-Jennings sampler, showed but two groups of five samples to contain more than a deviation of 1 per cent from the mean Fe content and but three groups indicated a deviation greater than 1 per cent in SiO_2 content. Average of all results on ore from the bed differed from the weighted average of ore to the bed by 0.4 per cent higher in Fe content and 0.7 per cent higher in SiO_2 plus Al_2O_3. It might be pointed out that very adverse weather conditions set in shortly after the test was undertaken (19 degrees below zero and an accumulated snowfall of 14.3 inches) and the frozen condition of the ore required that a bulldozer assist or entirely supplant the reclaimer in removing ore from the bed. Fortunately, the plant lent itself well to such necessary emergency measures to continue operations and statistical analysis of the results was gratifying.

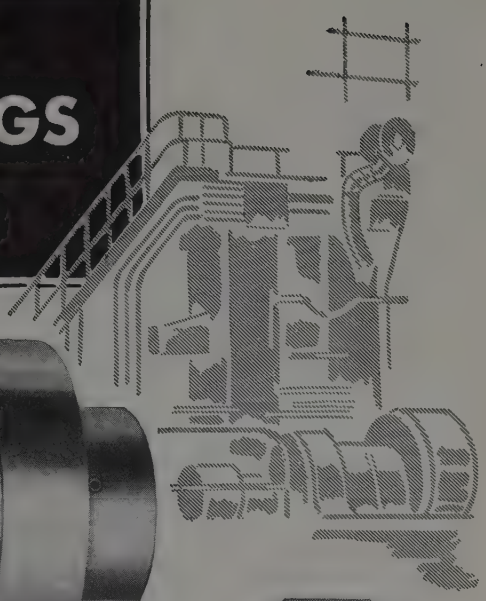
Table II gives a summary of analyses of five pairs of beds that were stacked from May 21 to Aug. 9, 1947, including beds Nos. 1 and 2 given in detail in Table I. During this period, ore was received not only from the Sunrise mine, but also from both Duncan and Blowout properties in Utah. Variations in iron content are from a low of 53.5 per cent to a high of 55.1 per cent, or 1.60 per cent; in silica from 8.27 to 9.90 per cent, or 1.63 per cent; in alumina from 2.49 to 2.04 per cent, or 0.45 per cent; in lime from 1.69 to 1.37 per cent, or 0.32 per cent; in magnesia from 0.52 to 0.81 per cent, or 0.29 per cent; in phosphorus from 0.071 to 0.127 per cent, or 0.056 per cent; in sulphur from 0.011 to 0.054 per cent, or 0.043 per cent. These variations are for quantities of not less than 31,640 tons, and as much as 35,669 net tons. Table II further indicates that there was a variation of from 34.5 to 40.3 per cent, or 5.9 per cent, in the

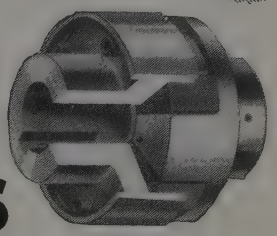
Why LOVEJOY FLEXIBLE COUPLINGS Do a *Better* Job



Lovejoy L-R Type "C", 2 to 2500 h.p. duties. Note extended steel collar for protection and minimum resistance. Pat. & Pats. Pend.







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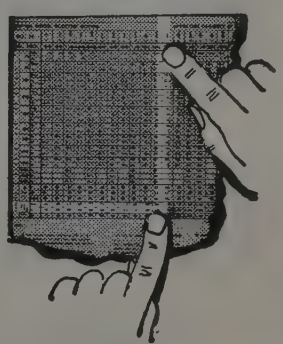
Lovejoy does a better job because free-floating resilient load cushions suspended between rugged jaws, are free to adjust instantly to every emergency—misalignment, shock, surge, backlash, vibration. Tough, long-lasting cushions are made of various materials, *each best suited to its particular service.* Reduction of noise is a Lovejoy characteristic. Couplings are non-lubricated, and do not require shutdowns for cushion changing. DELIVERY FROM STOCK.

Charts come with the Catalog which illustrates with full engineering data, couplings for every duty from 1/6 to 2500 h.p. Tedious figuring is eliminated. Charts lead your finger to the exact couplings you require. Prices and complete data right at hand. A big time-saver.



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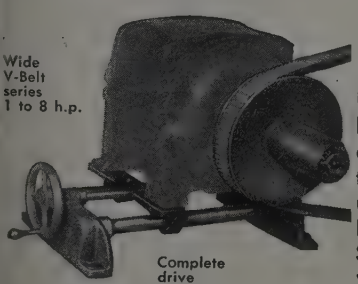

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Complete drive available.

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Units from fractional to 8 h.p. Provide desired fast or slow speed instantly by turn of handwheel. Ratios up to 3:1. Complete catalog also shows "Select-O-Speed" ratios up to 10:1; wide V-Belt and wide V-Belt Sheaves. Use coupon!

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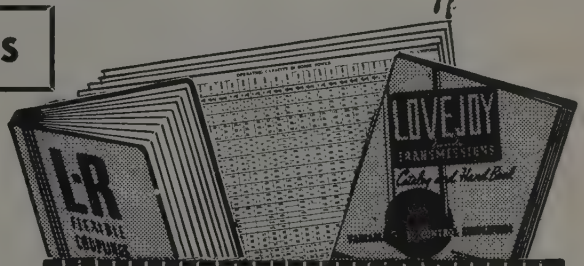

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amount of Sunrise ore, and an inverse variation in amount of Utah ores obtained in the beds making up 171,698 net tons of ore used at the furnaces during the typical period from June 5 to Aug. 22, 1947. Size of the bedding unit is not only large enough to limit chemical variations to low differences, but also is sufficiently large to bring two ores, one brought a distance of 374 miles and the other 950 miles by rail with irregularities in transportation incurred over mountain passes, to minimum variations in percentage make-up of the beds.

Variation in Fe and SiO_2 plus Al_2O_3 content that occurred between the beds that were stacked during the period from May 21 to Aug. 9, 1947, is set forth graphically in Fig. 6. A scale identical to the scale of Fig. 5 is adhered to in order to emphasize slight variations in the blended ores that were charged to the furnaces during a period of 78 days.

To determine benefits in blast furnace operation that may be attributed to use of ores prepared at the bedding and sintering plants, several spot periods of operation were selected. Due to extenuating circumstances of the time required in the preparation plant's construction, changes in ore and fuel characteristics, and possibly numerous other conditions, it is difficult to choose periods that would give the similarity of conditions that obtained in comparisons set forth in recent papers. However, the apparent magnitude of improvements in furnace operations can be indicated by the tabulation of some of the furnace operating data for various periods.

Furnace "E" was selected during the period of September and October, 1940, as representative of operations prior to ore preparation, and for the months of June and July, 1945, with the use of prepared ores. This furnace had been relined between these two periods with but slight alterations in furnace lines and a similar lining condition existed in both periods. Furnace "F" is set forth for the month of August, 1947, as representative of operations on the ore shown in Tables I and II. Principal dimensions of the furnaces are as follows:

	"E"—1940	"E"—1945	"F"—194
Hearth Diameter—			
	20 ft-6 in.	20 ft-6 in.	21 ft-9 in.
Bosh Diameter—			
	23 ft-3 in.	23 ft-3 in.	24 ft-9 in.
Stockline Diameter—			
	19 ft-6 in.	17 ft-6 in.	19 ft-0 in.
Large Bell Diameter—			
	14 ft-0 in.	13 ft-0 in.	14 ft-0 in.
Center line of tuyeres to stock line—			
	67 ft-9 in.	67 ft-9 in.	71 ft-5½ in
Working volume—			
	24,809	22,736	27,562
Number of tuyeres—			
	12	12	12

Some of the operating results fo

Time, Gentlemen, Time!
. . . high time to end this Uncivil War

THERE's a legend that in one part of the South, a pack of Johnny Rebs and a bunch of the Boys in Blue are still shooting at each other — because no one has been able to get close enough to tell them it's all over.

And that makes just as much sense as the *actual* feuding and fighting that goes on among some "grown-ups" in the world of business today. One side defending an outworn set of principles, prejudices and pompous protocol. The other side assaulting bitterly (with plenty of lavender and old lace in its *own* knapsacks). Who could guess that this is a buyer-seller relationship? Well, it is . . . and how often you see it: "You can buy my product . . . *but you'll have to fight, to get it!*"

Now, these Brass mills were operating at the time of the Civil War. But even then, Bristol never operated in the stifling stuffiness that constituted "the code". Almost 100 years old, Bristol has always been a young man's outfit, in which shirtsleeves are no crime and a laugh during business hours doesn't dock a week's pay. You'll find we serve up our service *plain*, without red-tape bows tied in hard knots. And if that's the way you *like* it, then here's the place you can *get* it . . . good Brass sheet, rod and wire made exactly as you *want* it. Glad to see you, or to come to see you, *any time you say*. Write.

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BRISTOL BRASS
CORPORATION

Makers of Brass since 1850, Bristol, Conn.

15 Park Row, New York City
418 Frick Building, Pittsburgh, Pennsylvania
1607 South Broadway, Dayton, Ohio
616 Temple Building, Rochester, New York
827 Hospital Trust Bldg., Providence, Rhode Island

two comparable periods on "E" furnace are summerized below. Comparison of the principal factors are as follows:

Iron production — Improved 197 tons per day or 38.2 per cent. This increase in production can no doubt in large measure be attributed to use of prepared ore and sinter from the preparation plant.

Coke consumption—Improved 195 lbs per ton or 9.7 per cent. Partially attributed to increased iron content of metallic mix and slag conditions, but regularity of ore charge allowed furnace to be burdened without the need for excess coke to insure against possible cold periods. Coke reduction made despite increase of 1.6 per cent in coke ash.

Stone consumption—Improved 368 pounds per ton or 36.3 per cent. Cumulative result of increased iron content of metallic mix and reduction in coke.

Regularity of product—Improved. Daily range of silicon in pig iron reduced from 0.57 to 0.25 per cent. Daily range of sulphur in pig iron reduced from 0.019 to 0.013 per cent.

Operation of furnace—Improved. Wind blown on furnace increased from an average of 50,213 to 58,475 cubic feet per minute with the integrated delivered wind including checks increasing from 36,539 to 44,179 cubic feet per minute with an average pressure increase of only 0.4 per square inch. Flue dust loss increased 19 pounds per ton pig iron but still held within reasonable limit of 100 pounds per ton pig. Stock movement was much more regular and flushing and casting operations were greatly improved. Burden changes were reduced from 12 to 9 in metallic mix; from 32 to 23 in stone from 151 to 12 in extra coke additions.

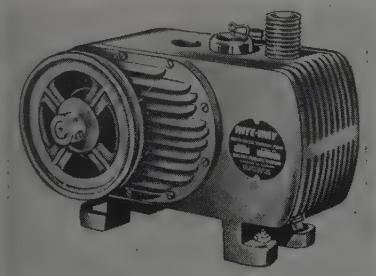
Tabulation of data on "F" furnace shows an additional increase in tonnage compared on the basis of hearth area. The coke rate is similar to the "E" furnace operation on prepared ores; an increase in slag volume, due principally to an additional increase in coke ash, brings this figure back to practically the "E" furnace period prior to use of prepared ores. A reduction in flue dust below either period indicates more regular stock movement, and improved wind delivery at lower pressure is typical of recent operation.

Paper presented before general meeting of American Iron & Steel Institute, New York, May 26-27, 1948.

New Products and Equipment

Vacuum Pump

With 15 inches of vacuum and a speed of 1700 revolutions per minute, the improved rotating plunger type vacuum pump, made by Rite-Way Products Co., 1241 Belmont Ave., Chicago 13, Ill., is rated at 4½-cubic feet free air per minute. It develops 28½-inches of vacuum on a blank



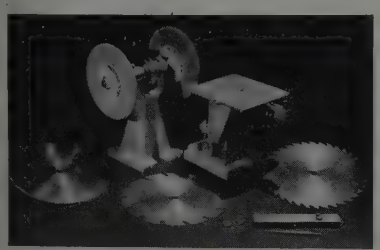
test. Featured are a built-in muffler and a sealed-in lubricating system.

Rotor of the pump is eccentrically mounted on a shaft rotating counterclockwise within the cylinder bore. There is no lost stroke; intake air mixes with oil which flows through the pump, lubricating all parts and sealing clearances. Oil vapor is condensed in muffler chamber and returns to exhaust chamber where it is sucked up by oil line and recirculated.

Check No. 1 on Reply Card for more Details

Saw Sharpening Fixture

Treyco Products, Buffalo 17, Ill., is manufacturing a saw sharpening fixture which holds and turns saws to insure precision sharpening and keeping the saw perfectly round. By



mounting the fixture on the same base with power-driven grinding wheel, the entire saw sharpening equipment is a self-contained unit.

Fixture is designed to sharpen three types of circular saws by using only two different shaped grinding wheels. One of the wheels has a 45 degree angle on one side and is used for sharpening cross cut or fine teeth on combination saws. The other grinding wheel is 5/16-inch wide with a radius for use on rip saws and for large teeth on combination saws.

Check No. 2 on Reply Card for more Details

Forging Preformer

National Machinery Co., Tiffin, O., is announcing the Reduceroll, a machine designed to reduce or preform forging blanks by rolling and to accurately distribute the stock to meet the requirements of the final forging. It is a separate unit which can be used in connection with hammers or forging presses, doing the same

work as the Maxiroll, an auxiliary Maxipres preforming attachment made by the company.

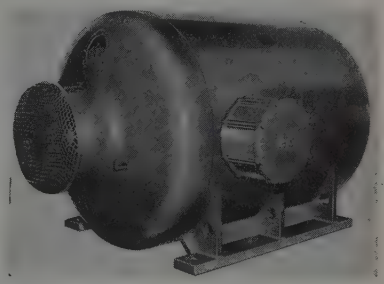
Eliminated are fullering and edging operations necessary to prepare blanks prior to impression die forging in a hammer. The machine requires but little skill, preforming in quantity uniform blanks free of shuts and folds. It is equipped with an air-controlled friction clutch, tripped for each pass by a conveniently located foot pedal. The rolls, circular, thus readily machined, are overhung to permit easy feeding, accessability and quick change. Five sizes are built.

Check No. 3 on Reply Card for more Details

Squirrel Cage Motors

Tube type, totally enclosed, fan cooled squirrel cage motors ranging from 150 to 600 horsepower are being made by Allis Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis. Internally, the motors are divided into two isolated parts with each side having its own path of internal air circulation. Because of this construction, it is possible, through simple maintenance, to keep the motor free of power destroying agents which tend to clog air passages.

Line is being offered with Underwriters' labels for 1-D or 2-G loca-



tions in ratings of 3600 revolutions per minute, 250 to 400 horsepower; 1800 revolutions per minute, 200 to 300 horsepower; and 1200 revolutions per minute, 150 to 200 horsepower.

Check No. 4 on Reply Card for more Details

Wire Take-Up Machine

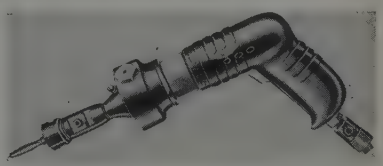
Black Industries, 1400 East 222nd St., Cleveland, O., is building a new wire and strip take-up machine. The first unit built is for use in plating steel wire. It will accommodate 36 reels. Each reel has an individual control for maintaining constant tension as the wire builds up on the reel.

Constant tension is held through individual motors. Controls are simple and the machine is driven by alternating current. Machine's principle can be adapted to meet the needs of many types of processing lines for taking up strip or wire products. The design may be modified to meet various requirements.

Check No. 5 on Reply Card for more Details

Push-Pull Tappers

Added to the line of air tools made by Aro Equipment Corp., Bryan, O., is a push-pull tapper, making easy portable tapping, retapping, chasing



and cleaning of tapped holes. Tools are automatically reversible, the operator pushing the tool for forward rotation and pulling for reverse. They are offered in 12 models with a speed range including 450, 750, 1100 and 2500 revolutions per minute.

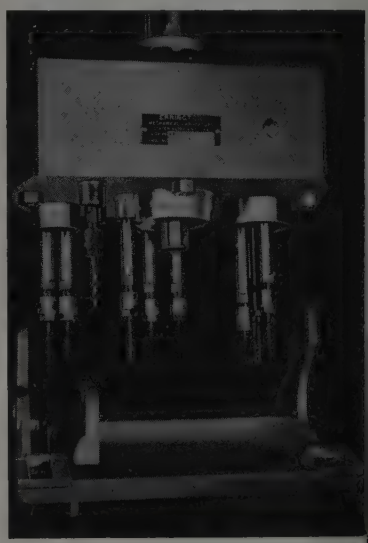
Tapping operations up to ¼-inch capacity in ⅛-inch sheet steel and

cleaning up to ⅜-inch tapped holes may be performed with the tools. Tap changing is simplified by a new type Jacobs tapping chuck. Standard equipment includes the chuck, wrenches, speed regulator and 8 feet of ¼-inch hose and fittings.

Check No. 6 on Reply Card for more Details

Drilling Head

Ten various sized holes may be drilled on different elevations with the 10-spindle multiple drilling head developed by Errington Mechanical Laboratory Inc., Staten Island 4, N. Y. The head has grooved thrust ball bearings at all thrust points and



hardened bronze radial bearings.

Heat treated spindles and gears of one piece are turned from solid bar stock. The head is geared at the ratio of approximately 2:1. Head is enclosed in a sand cast aluminum case and cover and provided with Alemite pressure lubrication.

Check No. 7 on Reply Card for more Details

Polishing Machine

Clarke Sanding Machine Co., Muskegon, Mich., is offering the Du portable electric sander-polisher with 21 accessories that quickly change it to a grinder, drill, steel wool buffer or wire brusher. It is offered as a sander-polisher only or with the accessories. It may be used to apply and polish wax, grind various shaped surfaces and narrow openings, sand and remove paint, dr holes up to ¼-inch in metal, composition and wood and wire brush to remove rust.

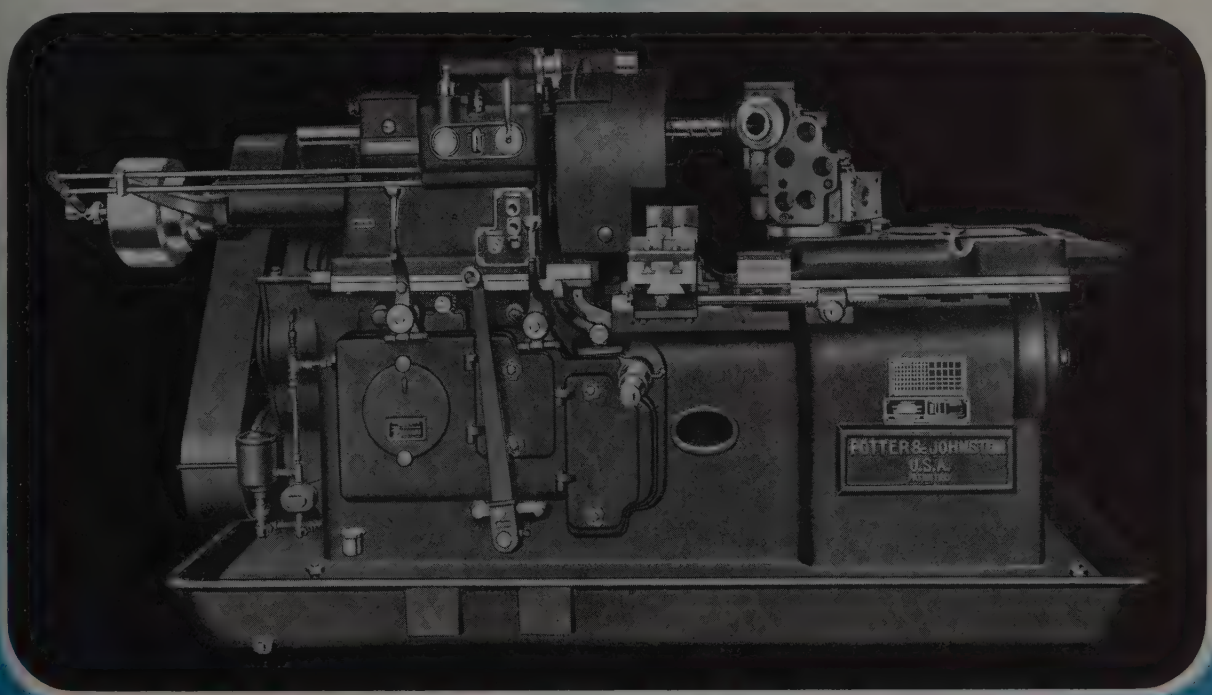
Tool is powered by a 115-volt alternating-direct current motor and has a 10 amp trigger switch. Fr

WELTERWEIGHT THAT PERFORMS LIKE A HEAVYWEIGHT..... P. & J.'S

4D

AUTOMATIC TURRET LATHE

This machine is designed to finish heavier castings and forgings, yet it produces the work as rapidly and as efficiently as the smaller and lighter automatic turret lathes. The Potter & Johnston 4D automatic turret lathe is so constructed that alignment remains permanent. Moreover, it has a remarkably long life. Check a few of these features: they will suggest some of the reasons why the 4D consistently pays its own way. BASE UNIT: of exceptionally heavy box section with hardened and ground steel ways of liberal dimensions. HEADSTOCK UNIT: adjustable so that minimum distance between spindle nose and the several turret faces may be varied 8½". SPINDLE SPEED: 15 changes of speed between 26 and 370 rpm., arranged in 5 sets of 3 automatic changes. Special semi-high and high speed models are available with spindle speeds of 35 to 492 rpm. and 69 to 696 rpm. respectively. FEEDS: 3 automatic variations of feed: coarse, medium and fine. CROSS SLIDE: swing over, 9¾" dia.; travel each way, 3¼"; turret travel 9½" to revolve. Cross slide and base are of new design, and entire mechanism is fully enclosed and operates in oil bath. TURRET FACES: 5 are provided for the mounting of tools. POWER: 7½ h.p. motor required to drive. NET WEIGHT: 8150 lbs. Boxed for sea shipment: 9000 lbs. Detailed description and specifications furnished on request.



POTTER & JOHNSTON CO.
PAWTUCKET, RHODE ISLAND
Subsidiary of
PRATT & WHITNEY
Division Niles—Bement—Pond Company

disk speed is 5000 revolutions per minute and normal load disk speed is 3000 revolutions per minute. It has a spur gear drive, with hardened steel pinion and bronze gears. The housing is of die cast aluminum.

Check No. 8 on Reply Card for more Details

Machine Tools

Heald Machine Co., Worcester 6, Mass., announces two machines, the model 171 internal chuck type grinder and the model 181 centerless machine. The model 171, available with both Size-Matic and Gage-Matic features of automatic sizing, is a fast, quickly set up, highly productive machine capable of grinding up to 2 inches inside diameter. Amount of infeed diminishes from roughing through finishing feed according to a preset rate, producing a spark-out effect as size is approached. Flared hydraulic tubing, close valve mounting and electric controls in dust-proof enclosure minimize maintenance.

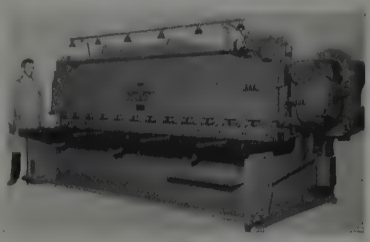
Grinder has an antifriction workhead cross slide, a compact wheel dresser, automatic way lubrication, permanently lubricated wheel heads and an isolated hydraulic pump and tank.

Model 181 centerless machine, for work up to 4 inches outside diameter which can be rotated on its outside diameter, produces uniform wall thickness and perfect concentricity between inside and outside diameters. Loading and unloading may be automatic. Like the model 171, it has controlled diminishing feed, faster cycles, automatic sizing and the antifriction workhead cross slide.

Check No. 9 on Reply Card for more Details

Steel Shear

Feature of the all steel shear built by Cincinnati Shaper Co., Hopple, Garrard and Elam Sts., Cincinnati, O., is the very low rake or shear



angle to the upper knife, important in insuring sheared strip with a minimum of twist, bow or camber. Shear shown has a capacity of ¼-inch mild steel 12 feet long. It will shear 10-gage strips, ¼-inch wide, 10 feet long, without twist.

Machine will effect savings by converting sheet stock to strips which are accurate and true for forming, punching, drawing or other operations. Light intensity is increased 10 times by projector floor lamps. Table light is also increased. The light beam shearing gage is useful when shearing to a scribed line in the production of gussets and other irregular shapes.

Check No. 10 on Reply Card for more Details

Squaring Shears

Following closely the design of its smaller shears, the five new power squaring shears developed by Columbia Machinery & Engineering Corp., Hamilton, O., have been further strengthened to withstand the strains of cutting heavier material. Main members, comprising the base, table, slide and top cross tie, are fabricated of heavy rolled steel plate. The eccentric shaft is forged of high carbon steel.

Five new capacities are 6 feet by ⅜-inch, 10 feet by ⅜-inch, 6 feet by ⅝-inch, 10 feet by ½-inch and 10 feet by ¾-inch, respectively, in mild steel. Blades are high carbon, high chrome steel. Clutch has six alloy

This Emblem means something to you, too

Membership in Gray Iron Founders' Society, Inc., is an indication of progressiveness. In one of America's great basic industries, the 600 members of the Society represent upwards of 75 per cent of the total output

Objectives of the Society are aimed at benefiting all users of Gray Iron components, as well as the member companies making these indispensable products for industry.

A long-range program of research, self-improvement and expansion has been launched by the Society, with these basic aims:

1. Assistance to users and potential users of Gray Iron in making their products better, in lowering their costs, or both.

2. Consultation and service to help members improve their products and their processes.

3. Education—within the membership, in technical schools and throughout industry as a whole—on the uses and characteristics of Gray Iron components.

GRAY IRONS PROVIDE THESE USEFUL PROPERTIES:

1. Machinability
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3. Heat resistance
4. Rigidity
5. Low notch sensitivity
6. Durability
7. Castability—dimensional accuracy
8. Wide selection of mechanical properties
9. Abrasion and wear resistance
10. Corrosion resistance

"Make It Better With Gray Iron"

GRAY IRON FOUNDERS' SOCIETY, INC.
33 PUBLIC SQUARE
CLEVELAND 13, OHIO

steel jaws with hardened faces, an automatic cam stop. All driving gears and the clutch are sealed and operate in oil. The upper blade can be adjusted horizontally for alignment.

Check No. 11 on Reply Card for more Details

Creep Testing Machine

Short time creep-rupture tests at high temperatures may be carried out with a minimum of operator attention with the motor-driven, screw type creep testing machine of 20,000 pounds capacity, built by Baldwin Locomotive Works, Philadelphia 42, Pa. It automatically maintains constant loads up to 100,000 pounds per square inch on standard 0.505-inch diameter specimens while temperatures are held constant up to 2200° F. Tests of this type may be run for 10 to 400 hours.

A feature is a flat 10 x 10 inch chart recorder panel in front, with which no extensometer is required and no strain readings need be made. The elongation versus time curve is automatically and accurately drawn on the chart from the start of the test until rupture occurs. Specimen is loaded below through gearing by means of a large, electric motor-driven screw having a stroke of about 4 inches. The machine can also be adapted readily to short-time tensile tests, constant strain-rate tests or relaxation tests.

Check No. 12 on Reply Card for more Details

Fork Truck

Need for a light weight fork truck is met with the type FRH-20 center control model, made by Baker Industrial Truck Division of Baker-Raulang Co., 2168 West 25th St., Cleveland, O. It finds application

in plants where narrow aisles, congested areas, limited floor capacity, small and low capacity elevators are a factor and wherever loads can be limited to 2000 pounds and 36 inches long. Truck has a 42-inch wheelbase, 30-inch width and an overall length, exclusive of forks, of 63 inches.

Right turns are accomplished in 76½-inches, plus load length. Weight of truck is 3850 pounds. The travel controller provides three speeds forward and reverse. It is interlocked with a foot switch and with the contactor in such a way that the truck may be started only with the controller in first speed when the seated driver depresses the foot switch treadle with his right foot. Removal of foot to apply brakes automatically cuts power to motor.

Check No. 13 on Reply Card for more Details

Fluxmeter Calibrating Unit

Calibration of both the indicating fluxmeter and the fluxmeter type photo-electric recorder is possible with a new device announced by General Electric Co.'s Meter and Instrument Divisions, Schenectady 5, N. Y. The unit consists of an alnico magnet rod and a housing with a built-in search coil which is tapped and connected through a selector switch and terminal post. The magnet, one end of which is painted

black is 10 inches long and ⅝-inch in diameter.

In use the unit is set upright with the unpainted end of the magnet placed in the opening atop the housing. Unit is then connected in series with the search coil to be used in making the flux measurement and the switch is set at the desired value of flux linkages. When magnet is removed, the desired flux-linkage takes place, making it possible to calibrate the fluxmeter or recorder so that each millimeter of scale reading will be equivalent to a known value of flux-linkages.

Check No. 14 on Reply Card for more Details

Die Casting Machine

Aluminum castings weighing up to 10 pounds and zinc castings up to 30 pounds may be formed in the 800-ton locking pressure die casting machine built by Kux Machine Co., 3940 West Harrison St., Chicago, Ill. Having a die space of 40 x 25 inches

between the tie bars and 17½-inches of die separation, very large dies can be accommodated and castings having a deep draw are easily produced. Machine is hydraulically operated and electrically controlled.

Three to four zinc or two aluminum casting cycles per minute are possible. As a gooseneck plunger type machine (model BH-40) it will produce zinc, lead or tin die castings and has its own melting pot and furnace incorporated in it. For aluminum, magnesium or brass castings (model HP-40), it has a cold chamber hand ladling injection unit. It is also offered as a convertible machine (model BH-40C), having both the gooseneck plunger mechanism and the cold chamber hand ladling unit.

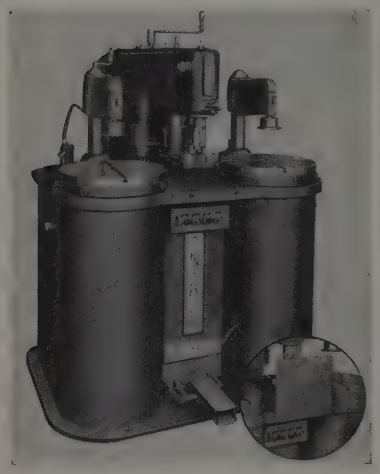
Check No. 15 on Reply Card for more Details

Milling Machine

Aluminum and other nonferrous metals with similar cutting characteristics may be turned into round, rectangular or irregularly contoured parts up to 18 inches in overall diameter on the A-18 rotary table contour milling machine, developed by Onsrud Machine Works Inc., 3900 Palmer St., Chicago 47, Ill. Con-

tinuous production is maintained by use of two tables, one of which is being loaded while the other is being milled.

As each milling operation is completed, the operator presses a pedal which automatically disengages the driving clutch for the rotating table, engages the clutch for the waiting table and shifts the cutting tool to



the new work. As operations are completely automatic unskilled labor may be used. Cutter head assembly consists of high speed belt driven spindle, cutter and guide roller, the latter contacting pattern under the work to guide the cutter. Work is held in place with 700-pound pressure. Cutter spindle operates at speed of 11,500 revolutions per minute.

Check No. 16 on Reply Card for more Details

• • •

ELECTRODE: No. 90-PL electrode offered by Hobart Brothers Co., Troy, O., is a low hydrogen coated electrode designed for welding high carbon, high sulphur and other hard-to-weld steels without underbead cracking. It is available in $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{32}$, and $\frac{1}{4}$-inch diameters for use with direct current welding current only.

Check No. 17 on Reply Card for more Details

FIRE EXTINGUISHERS: American-La France-Foamite Corp., Elmira, N. Y., announces a new line of 2½ gallon resistance welded silicon bronze fire extinguishers. They are soda-acid, foam, plain water and antifreeze types.

Check No. 18 on Reply Card for more Details

DRUM PUMP: General Scientific Equipment Co., Philadelphia 32, Pa., offers a new drum pump that has a special spider design of the piston and intake opening that provides a cut-through action and large capacity that handles any fluid, which seeks its own level, except lacquer thinners. It is available in three models.

Check No. 19 on Reply Card for more Details

FLOOR PATCH: To quickly repair concrete floors, a fast drying floor patch, designated as Tampatch, has been developed by United Laboratories Inc., Cleveland, O. It may be applied to broken, rough or uneven concrete surfaces, interior or exterior.

Check No. 20 on Reply Card for more Details

WAGON DRILL: A new wagon drill, model BW-1, equipped with the new model 105, 1¼-inch drifter rock drill is announced by Independent Pneumatic Tool Co., Aurora, Ill. It features a single reversible pneumatic motor that feeds and raises the drill, eliminating the need of a hoist.

Check No. 21 on Reply Card for more Details

ADJUSTABLE FEET: Type FS adjustable feet introduced by Ohio Nut & Bolt Co., Berea, O., serve a dual purpose. When modern appliances are mounted on wooden shipping skids, the feet can be used as crating bolts. No lock washers are required as the scalloped flanges will prevent loosening of the feet. Foot is bent slightly upward at the end to prevent scratching of the floor and to facilitate adjusting with fingers, wrenches or pliers.

Check No. 22 on Reply Card for more Details

WELDING ROD: Eutecrod 1805FC, developed by Eutectic Welding Alloys Corp., New York, N. Y., is recommended for a number of production applications necessary in the joining of copper. It may be used with a torch adjusted for slight oxidizing flame, atomic hydrogen or twin carbon arc, where no oxyacetylene equipment is available.

Check No. 23 on Reply Card for more Details

HAND TOOLS: For wiring applications requiring installation of solderless terminals by manually operated tools Aircraft-Marine Products Inc., Harrisburg, Pa., has developed a new line of hand tools to eliminate the possibility of faulty electrical connections resulting from operator fatigue or carelessness. Designated as Certi-Crimps, tools incorporate a device that prevents reopening of tool for admission of a new terminal until it has been completely closed for a perfect crimp on a previous terminal.

Check No. 24 on Reply Card for more Details

PIPE MENDING CEMENT: Lake Chemical Co., Chicago 12, Ill., announces Plumber Krak-Stik, a pipe mending cement in stick form. Applied by rubbing the stick heavily over any crack or leak, it stops the leak instantly even while liquid runs through the pipes under pressure or remains in the container.

Check No. 25 on Reply Card for more Details

AIR HAMMER: Designated as Big Bully, a new air hammer is introduced by Superior Mfg. Co., Cleveland, O. It is designed to handle heavy jobs of chipping, scaling, chiseling, grooving, etc. in factories and foundries. By varying finger pressure on trigger, operator can regulate power from a light tough to the full strength of 8000 blows per minute.

Check No. 26 on Reply Card for more Details

CHEMICAL SEALANT: Designed primarily for impregnation and salvage of low density metals such as aluminum and magnesium alloys, the new chemical sealant offered by Western Sealant Co., Culver City, Calif., can also be applied to castings of bronze, steel and gray iron. Its application is clean and surfaces, ducts, pockets or machined areas show no visible sign of the treatment.

Check No. 27 on Reply Card for more Details

TEMPLATE: No. 40 circle template on which 39 circles are grouped in progressive sizes with increments in 64ths, 32nds, 16ths and 8ths of an inch, is offered by Rapidesign Inc., Glendale, Calif.

Check No. 28 on Reply Card for more Details

PARTITION SYSTEM: The partition members of the new Milcor solid partition system, offered by Inland Steel Products Co., Milwaukee, Wis., are designed so they can be used in several different combinations to meet varying building requirements. The 2-inch solid plaster partitions are resistant to fire, shock, physical impact and sound.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

OUTLOOK— High degree of uncertainty over future developments pervades the steel markets as the experts seek to determine the import to the national economy of the wholly unexpected Democratic victory in the national elections.

With continued heavy steel demand in prospect, so heavy in fact all needs can not be promptly and fully satisfied, the steel producers find themselves on an uncomfortable spot. Naturally, they view with some concern possible government policy with respect to inflationary trends, price and distribution controls, and labor relations.

GOVERNMENT POLICY—Should the inflation spiral continue, steel men expect government price-fixing eventually. Steel and affiliated products certainly will be a target for the price fixers because of their basic role in the economy. Also, with continued strong steel demand mandatory allocations loom as a threatening possibility, especially in view of the fact voluntary allocations programs are due to expire at the end of February. Further, considering labor's role in the Democrats' victory, modification, at the very least, of the Taft-Hartley labor relations law is believed a certainty, with a fourth-round wage increase likely in event the inflationary trend continues.

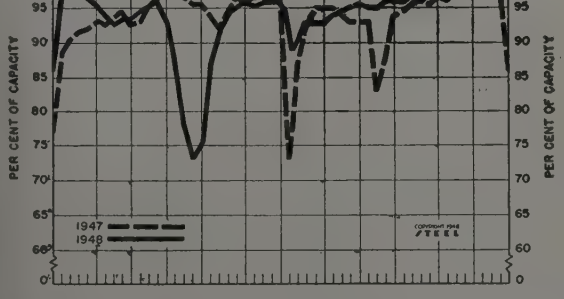
STEEL DEMAND— There is nothing in the picture to indicate any slackening in consumer requirements over coming months. If anything, stringency in supply may become even more severe as the tempo of defense demand mounts. The shortage of plates currently is so severe many consumers are seeking tonnage in the gray market, much as in the case of sheets and pipe. Structural fabricating shops have comfortable order backlogs but many of them are unable to obtain sufficient steel to support good operating schedules. No improvement in supply conditions with respect to sheet, strip and pipe is indicated.

CONSUMERS QUOTAS— Most steel producers to date have not set up quotas beyond January, for the most part moving cautiously on shipments beyond the end of this year. In general the pattern of distribution is becoming more confused with resulting complications in consumers' operating schedules. Lending to the uncertainty in the situation is the question as regards what is going to happen to Public Law 395 under which voluntary allocations have been set up. This expires at the end of February. Whether it will be extended or replaced by mandatory allocations of even greater scope is anyone's guess.

PRICES— In the cold light of the election returns and possible imposition of government price control should inflationary trends continue, feeling in steel circles is that producers will move cautiously in adjusting prices. Costs must be reckoned with, of course, and some advances may be recorded over coming weeks. However, barring unforeseen developments, a broad upswing in steel prices in the near future seems unlikely. Except for an increase of $25 per ton on silicon sheets by one producer, and a raise of $3 per ton on electric furnace silvery iron by another, the market was devoid of price changes last week. One maker of stainless clad steel announced a substantial reduction in quantity extras. Something of an easier tone appears developing in scrap, and talk is heard of a possible price decline. Steelmakers' inventories now are the best in many months and the increasing flow of scrap from abroad is serving as a brake on the domestic market in some areas.

COMPOSITES—STEEL'S arithmetical price composites held unchanged last week and compared with those for the like 1947 week as follows: Finished steel, $95.05 and $76.09; semi-finished steel, $75.75 and $57.20; steelmaking pig iron, $46.29 and $36.28; steelmaking scrap, $43.25 and $40.42.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Nov. 6	Change	Same Week 1947	Same Week 1946
Pittsburgh	95.5	— 1.5	101	97.5
Chicago	99	— 0.5	94.5	92
Eastern Pa.	95	None	93.5	77
Youngstown	105	+ 1	92	91
Wheeling	91	+ 1	86	89
Cleveland	99.5	+ 0.5	90.5	94
Buffalo	104	None	88.5	88.5
Birmingham	100	None	99	99
New England	90	+ 3	86	88
Cincinnati	106	+ 2	91	93
St. Louis	89.5	None	80	68
Detroit	100	— 1	89	86
Estimated national rate	99	None	96	91.5

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Nov. 6	Oct.30	Month Ago Oct. 1948	Year Ago Nov. 1947	5 Years Ago Nov. 1943
Finished Steel	$95.05	$95.05	$95.05	$76.09	$56.73
Semifinished Steel	75.75	75.75	75.75	57.20	36.00
Steelmaking Pig Iron	46.29	46.29	46.19	36.38	23.00
Steelmaking Scrap	43.25	43.25	43.25	40.42	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Oct. 1948	4.14340c
Sept. 1948	4.12679c
Aug. 1948	4.14340c
Oct. 1947	3.45536c
Oct. 1943	2.40831c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. September and October, 1948, figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Nov. 6 1948	Oct. 1948	Aug. 1948	Nov. 1947
Steel bars, Pittsburgh mills	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia	3.79	3.79	3.79	3.318
Steel bars, Chicago mills	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills	3.275	3.275	3.275	2.80
Shapes, Chicago mills	3.25	3.25	3.25	2.80
Shapes, del. Philadelphia	3.48	3.48	3.48	2.954
Plates, Pittsburgh mills	3.50	3.50	3.50	2.95
Plates, Chicago mills	3.40	3.40	3.40	2.95
Plates, del. Philadelphia	3.71	3.71	3.71	3.17
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.55
Bright basic, wire, Pittsburgh	4.325	4.325	4.325	3.675
Wire nails, Pittsburgh mills	5.775	5.775	5.775	4.625
Tin plate, per base box, Pitts. dist.	$6.70	$6.80	$6.80	$5.75

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$53.57
Slabs, Chicago	52.00	52.00	52.00	40.18
Rerolling billets, Pittsburgh	59.00	59.00	59.00	40.18
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.05c

* Nominal.

Pig Iron

	Nov. 6 1948	Oct. 1948	Aug. 1948	Nov. 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$37.91
Basic, Valley	46.00	46.00	43.00	36.00
Basic, eastern del. Philadelphia	50.17	47.77	46.17	38.84
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	37.41
No. 2 fdry., del. Philadelphia	50.67	48.27	46.67	39.34
No. 2 foundry, Chicago	46.25	45.13	43.25	36.00
No. 2 foundry, Valley	46.50	43.50	43.50	36.50
Southern No. 2 Birmingham	43.38	43.38	43.38	34.88
Southern No. 2 del. Cincinnati	49.09	49.09	49.09	38.54
Malleable, Valley	46.50	46.50	43.50	36.50
Malleable, Chicago	46.50	45.38	43.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	62.00	46.40
Ferromanganese, fob Aetna, Pa.	163.00	163.00	148.00*	151.00

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$42.75	$42.75	$42.75	$40.00
Heavy melt. steel, No. 2, E. Pa.	41.50	41.50	41.50	41.62
Heavy melt. steel, No. 1, Chicago	41.75	41.75	41.75	38.75
Heavy melt. steel, No. 1, Valley	42.75	42.75	42.75	39.87
Heavy melt. steel, No. 1, Cleveland	42.25	42.25	42.25	39.62
Heavy melt. steel, No. 1, Buffalo	48.25	48.15	46.56	41.81
Rails for rerolling, Chicago	64.50	65.50	64.13	56.25
No. 1 cast, Chicago	70.50	70.75	70.75	49.00

Coke

Connellsville, beehive furnace	$14.50	$14.50	$14.38	$12.25
Connellsville, beehive foundry	17.00	17.00	17.00	14.50
Chicago, oven foundry, ovens	20.40	20.40	20.40	17.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-$105 per gross ton. Forging quality $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa.; $66, Monessen, Pa.; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill, except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c, Monessen, Pa. One producer quotes 3.90c, Chicago base. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Aliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Atlanta, Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill.; 4.80c, Williamsport, Avis, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.45c, Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.10c, Pittsburgh; 4.25c, S. Duquesne, Johnstown, Pa., Gary, Ind., Lackawanna, N. Y., Youngstown; 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; 5.25c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa., 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburgh, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O., 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c Granite City, Ill., Ecorse, Mich.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 ce zinc) 4.40c, mill, except: 5.00c, Niles, C 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kok mo, Ind.

Galvannealed Sheets: 4.95c, mill, excep 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, C 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Ste (based on 5-cent zinc): 5.00c, mill, excep 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, excep 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mi Armature: 5.45c, mill, except: 5.95c, Warre O.; 6.05c, Niles, O. Electrical: Hot-rolled, 5.95c, mill; excep 6.05c, Kokomo, Ind.; 6.15c, Granite City, Il 6.45c, Warren, O.; 6.55c, Niles, O. Motor: 6.70c, mill except: 6.90c, Granite Cit Ill.; 7.20c, Warren, O.; 7.95c, Follansbee, Va., Toronto, O.; 9.20c, Brackenridge, Pa Dynamo: 7.50c, mill, except: 8.65c, Follansbee, W. Va., Toronto, O.; 7.70c, Granite Cit Ill.; 10.00c, Brackenridge, Pa.

Transformer 72, 8.05c, mill, except; 9.1 Follansbee, W. Va., Toronto, O.; 11.3 Brackenridge, Pa. 65, 8.60c, mill, excep 9.85c, Follansbee, W. Va., Toronto, O.; 12.3 Brackenridge, Pa.; 58, 9.30c, mill, excep 10.55c, Follansbee, W. Va., Toronto, 13.05c, Brackenridge, Pa.; 52, 10.10c, m except: 11.35c, Follansbee, W. Va., Toronto.

High-Strength Low-Alloy Sheets: Hot-rolled 4.95c, mill, except: 5.25c, Ecorse, Mich., a Conshohocken, Pa., mills. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecor Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich., Atlanta; 3.60c, Detroit; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

* Wider than 6-in. and 6-in. and narrower, respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Rolled Alloy Strip: 9.50c, mill, except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00. Pittsburg, Calif., mill $7.35 and $7.55, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

Can Making Black Plate: Per base box of 100 lb, 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30. $5.95, $5.85, $5.95, respectively, Pittsburg, Calif.

Holloware Enameling Black Plate: 29-gage, 4.75c per pound, except: 4.85c, Sparrows Point, Md.; 4.95c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90, except: $6 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c., Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.00c, Atlanta; 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa., Minnequa, Colo., Buffalo; 4.70c, Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer quotes 4.50c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md.; 4.95c, Monessen, Pa.; 5.10c, Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 5.15c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.60c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109 Worcester, Mass.; 110 Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburg, Calif.; 124, Cleveland; 126, Monessen, Pa.; $6.75 per 100 pound keg, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 109, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113, Monessen, Pa., Kokomo, Ind.; 116, Minnequa, Colo.; 121 Atlanta; 132, Pittsburg, Calif. One producer quotes column 113, Pittsburgh and Chicago base; another, column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126, Atlanta; 128, Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes 127, Chicago and Pittsburgh base.

Fence Posts (with clamps): Column 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113 Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes column 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	41½	12– 12½	1	46– 48½	27– 29½
¼	39½	13½– 14	1¼	46½– 49	27½– 30
⅜	36	8½– 9	1½	47– 49½	28– 30½
½	40½– 43	20– 22½	2	47½– 50	28½– 31
¾	43½– 46	24– 26½	2½, 3	48– 50½	29– 31½
			3½ & 4	44½	27½

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	39½	19½– 20	38½	18½	27– 38½	7½ 19
2½	42½– 43½	22½– 24	41½	21½	32½– 41½	13– 22
3	42½– 43½	22½– 24	41½	21½	35– 41½	15½– 22
3½ & 4	42½– 46½	23– 27	43½	23½	38½– 43½	19– 24
5 & 6	42½– 44½	23– 24½	43½	23½	38½– 43½	19– 24
7	....	....	....	....	43½	22½

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	40½	....	1¼	47– 48	28– 29
¼	38½	....			
⅜	35	....	1½	47½– 48½	28½– 29½
½	41– 42	20½– 21½	2	48– 49	29– 30
¾	44– 45	24½– 25½	2½ & 3	48½– 49½	29½– 30½
1	46½– 47½	27½– 28½	3½ & 4	43½	....

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	38½	19	37½	17½	26– 37½	6½– 18
2½	41½– 42½	23	40½	20½	31½– 40½	12– 21
3	41½– 42½	23	40½	20½	34– 40½	14½ 21
3½-4	41½– 45½	22– 26	42½	22½	37½– 42½	18– 23
5 & 6	41½– 43½	22	42½	22½	37½– 42½	18– 23
8	45½	..	44½	23½– 24	40½– 44½	20– 24
10	45	....	44	23– 23½	41½– 44	21– 23½
12	44	....	43	22	40½– 43	20– 22½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Bulk	Butt Weld Gal.	In.	Lap Weld Bulk	Lap Weld Gal.
⅜	+59½	+93	1¼	+22	+50½
½	+20½	+50	1½	+15½	+43
¾	+10½	+39	2	+ 7½	+34
1 and 1¼	+ 4½	+30	2½-3½	+ 5	+29½
1½	— 1½	+26½	4	List	+23½
2	— 2	+26	4½-8	+ 2	+25
			9-12	+12	+34½

Boiler Tubes: Net base c.l. prices, dollars per 100′, mill; minimum wall thickness, cut lengths 4 to 24″; inclusive.

O.D. In.	B.W. Ga.	Seamless Hot Rolled	Seamless Cold Drawn	Elec. Weld Hot Rolled	Elec. Weld Cold Drawn
1	13	....	13.39	13.00	13.00
1¼	13	....	15.87	13.21	15.39
1½	13	$15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb, mill.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $4.70 per 100 lb, Williamsport, Pa.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: 5.25c, Pittsburgh.

Axles: 5.20c, mill.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

	A.S. Light	A.S. Reg. and Heavy
Semifinished hexagon	41 off	38 off
7/16-in. and smaller	.....	.....
½-in. and smaller	39 off	.....
½-in.-1-in.	.....	37 off
⅝-in.-1-in.	37 off	35 off
1⅛-in.-1½-in.	34 off	28 off
1⅝-in. and larger		

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
7/16-in. and under	48 off

Washers, Wrought

Fob shipping point, to jobbers...Net to $1 off

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.39	50.89	51.39	51.89
Brooklyn, N. Y., del.	....	52.40	52.90	....
Philadelphia, del.	50.17	50.67	51.17	51.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	*47.00	*47.00	*47.50	48.00
Boston, del.	55.42	55.42	55.92	....
Rochester, del.	49.22	49.22	49.72	50.22
Syracuse, del.	50.025	50.025	50.525	41.025
§**Chicago, district furnaces**	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.72	47.72-48.22	48.22	48.72
Muskegon, Mich., del.	....	50.98-51.48	51.48	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.17	48.67	48.67	49.17
Lone Star, Tex., furnace	....	†75.00	....	....
Duluth, furnace	....	46.00	46.50	47.00
Erie, Pa., furnace	45.50	46.00	46.50	47.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	53.63	....	....
Portland, Oreg., del.	....	53.63	....	....
Los Angeles, San Francisco	53.13	53.63	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65	49.15	49.65	....
Ironton, Utah, furnace	....	46.50	....	....
‡**Neville Island, Pa., furnace**	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	45.50	46.00	46.50	47.00
Cincinnati, del.	50.05	50.55	....	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	49.87	50.37	50.37	50.87

* Republic Steel Corp. quotes $1 a ton higher for basic, No. 2 foundry and malleable at Buffalo.

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$59.50		
6.51-7.00	60.75	9.01- 9.50	67.00
7.01-7.50	62.00	9.51-10.00	68.25
7.51-8.00	63.25	10.01-10.50	69.50
8.01-8.50	64.50	10.51-11.00	70.75
8.51-9.00	65.75	11.01-11.50	72.00

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $84.75 furnace, Niagara Falls; $84 open-hearth anu $85 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. ..$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., $54; Buffalo, Troy, N. Y., $50. Philadelphia, $56.81 delivered.

Intermediate phosphorus, Central furnace, Cleveland, $51.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more $37; less than 60% $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-15.50
Connellsville, foundry	16.00-18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
New England, del.	22.75
Chicago, ovens	20.40
Detroit, del.	23.95
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Detroit, del.	24.40
Ironton, O., ovens	18.25
Painesville, O., ovens	20.90
Erie, del.	22.57
Cleveland, del.	22.46
Buffalo, del.	23.25
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens	19.25
Detroit, ovens	20.65
Detroit, del.	*21.65
Flint, del.	22.85
Pontiac, del.	21.91
Saginaw, del.	23.15

*Includes representative switching charge of $1.

Coal Chemicals

Spot, cents per gallon, ovens

(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50

Per pound, ovens

Phenol, 40 (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00
Naphthalene flakes, balls, bbl to jobbers, "household use"	12.00

Per ton, bulk, ovens

Sulphate of ammonia	$45.00

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned bulk: Grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Sliding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69%	18.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Standard Structural Shapes	Carbon ⅜"-¾"	Floor ⅜" & Thicker
Boston (city)	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24-9.74	5.54	5.89	7.34
Boston (c'try)	5.69	6.49	7.69	5.89	6.75	5.54	6.24	8.09-9.59	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.83	6.58	8.22	5.52-5.78	5.98	7.48
New York (c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.63	6.38	...	5.32-5.58	5.78	7.28
Phila. (city)	5.50-5.86	6.61-6.81	7.42-7.62	5.46-5.81	...	5.57-5.65	6.31	8.39	5.24-5.40	5.52-5.65	6.73-7.16
Phila. (c'try)	5.35-5.71	6.46-6.66	7.27-7.47	5.31-5.66	...	5.42-5.50	6.16	8.24	5.09-5.25	5.37-5.50	6.58-7.01
Balt. (city)	5.43†	6.33	7.13	5.49	...	5.54	...	...	5.48	5.68	7.13
Balt. (c'try)	5.28†	6.18	6.98	5.34	...	5.39	...	...	5.33	5.53	6.98
Norfolk, Va.	5.75	...	...	...	...	6.00	7.00	...	6.00	6.00	7.50
Wash. (w'house)	5.81-5.97	...	...	5.87	...	5.88-5.92	6.58	...	5.82-5.86	6.02-6.06	7.47-7.51
Buffalo (del.)	5.20-5.25	5.95-6.00	7.75	5.70	6.50	5.35	6.05	9.50	5.25	5.60	7.70
Buff. (w'house)	5.05-5.10	5.80-5.85	7.60	5.55	6.35	5.20	5.90	9.40	5.10	5.45	7.55
Pitts. (w'house)	4.85-5.00§	5.75-5.85[8]	7.00-7.05	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Det. (w'house)	5.40-5.75§	6.30-6.60	7.60	5.40-5.70	6.50	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.90‡‡	5.90-6.29	7.34-8.00‡‡	5.17-5.69	6.85	5.30-5.34	6.05-6.10	8.24-8.54	5.34-5.60	5.50-5.54	6.95-6.99
Cleve. (w'hse)	4.98-5.75	5.75-6.14	7.19-7.85	5.02-5.54	6.70	5.15-5.19	5.90-5.95	8.09-8.39	5.19-5.45	5.35-5.39	6.80-6.84
Cincin. (w'hse)	5.26	6.11	7.60	5.52	6.07	5.52	6.07	...	5.37	5.61	6.91
Chicago (city)	5.20	5.90‡[8]	7.20	5.00	6.30	5.05	5.85	7.80[9]	5.05	5.25	6.70
Chicago (w'hse)	5.05	5.75‡[8]	7.05	4.85	6.15	4.90	5.70	7.65[9]	4.90	5.10	6.55
Milwaukee (city)	5.37	6.07‡[8]	7.37	5.17	6.47	5.22	6.02	7.97[9]	5.22	5.42	6.87
St. Louis (del.)	5.34§	6.24[8]	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. L. (w'hse)	5.19§	6.09[8]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41-7.66
Birm'ham (c'try)	5.05§	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26-7.51
Omaha, Nebr.	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
Los Angeles (w'house)	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
San Francisco	5.95[21]	7.15	8.05	6.75[21]	8.25[16]	5.90[21]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma	6.35[17]	7.90[5]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[2]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

• Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ top level of quoted range is nominal.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $57, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn.) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $160 per gross ton of alloy, c.l., packed, $172; gross ton lots, packed, $187; less gross ton lots, packed, $204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y. ;or Welland, Ont. Base price; $165, Rockwood, Tenn.; $162, f.o.b. Birmingham and Johnstown, Pa., furnaces; $160, Sheridan, Pa.; $163, Aetna, Pa. Shipment from Pacific Coast warehouses on one seller add $31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Ore. Shipment from Chicago warehouse, ton lots, $201; less gross ton lots, $218 fob Chicago. Add or subtract $2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 26.0c, ton lot 27.1c, less ton 28.3c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb. of contained Cr, c.l., packed 22.9c, ton lot 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.05% C 29.25c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50-17.50c per lb of contained Si; packed 18.90c; ton lots 20.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.5c per lb of contained Si, carload packed 12.1c, ton lot 13.55c, less ton 15.2c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.0c per lb of contained Si, carload packed 14.3c, ton lot 15.45c, less ton 16.7c. Delivered. Spot, add 0.3c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Mn, 97% Si and 1% max. Fe.). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. D., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c, smaller lots 8.65c; or, lump, carload, bulk, 8.40c per lb of alloy, packed c.l. 9.20c, ton lots 9.30c, 200 to 1000 lb 9.65c, less 200 lb 10.15c per lb of alloy. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

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Lead Prices Rise to Record High

Leading sellers advance prices to range of 21.30c to 21.35c, St. Louis. Lead and zinc products, secondary aluminum and brass ingots also move higher. Demand continues heavy

New York—Effective as of Nov. 1, leading sellers of lead advanced prices 2 cents a pound to the basis of 21.30c to 21.35c, St. Louis, a new all-time high. The advance here was preceded by upward revisions in domestic secondary and scrap lead prices and in foreign refined metal prices.

Secondary aluminum smelters advanced prices on all grades of remelt ingots ½ to 1 cent a pound as of Oct. 27, following rises in aluminum scrap. A leading producer of brass ingots advanced prices ½ to ¾-cent a pound as of Nov. 1. Undertone of other major metal markets remained firm to strong.

Copper—Supplies of copper continued to shrink last week as a result of the shutdown of Kennecott Copper Corp.'s Utah properties which remained strikebound. Delivery of November metal will be sharply reduced while no commitments are being made in regard to December delivery. The loss in production is estimated at about 5000 tons per week. Electrolytic held at 23.50c, delivered Connecticut Valley.

Lead—The advance in lead was attributed to the following factors by trade interests here: Recent sales of foreign lead to domestic consumers at prices well above the domestic market; large premiums paid for remelt and secondary refined lead and the situation in scrap lead in which smelters eliminated the smelting charge for battery plates and generally paid the freight charge from point of origination.

Following the advance in primary lead, a leading manufacturer advanced prices of lead products 4 to 4.75 cents per pound. The new prices are as follows: Full lead sheets, 140 sq ft, 27.25c; lead pipe ⅝-inch to 6 inches, metropolitan area, 27.25c; lead traps and bends, list plus 80 per cent.

Consolidated Mining & Smelting Co. of Canada announced an increase of 2 cents a pound in lead to the basis of 20.75c, delivered at Montreal or Toronto. The former price had been in effect since July 30.

Small tonnages of Australian lead continue to be sold to American users at the equivalent of 21.50c a pound at New York. Naming of a daily price was discontinued for Mexican lead sold abroad, the latest reported price having been 20.00c, f.a.s. Gulf of Mexico ports. Prices reported paid by users in this country for other than Mexican or Australian lead range up to 24.25c a pound. Approximately the same price is reported to have been paid for lead recovered from domestic scrap.

Zinc — Rollers of zinc products advanced their prices 1/2-cent a pound, effective as of Nov. 1, due to the recent advance in slab zinc prices. The market for strip zinc is now quotable at a range of 18.75c to 19.50c while the range on sheet zinc is 20.00c to 20.50c, both f.o.b. mill. Small zinc boiler plates are quoted 17.75c to 18.50c while large plates are quoted 18.75c to 19.50c.

Supplies in the domestic market remain tight with consumers pressing for coverage at the 15.50-cent East St. Louis level.

Tin—The third session of the International Tin Study Group, which was held late last month at The Hague, studied the report of its own working party which had met in June. "The purport of this report was that it would be appropriate and practicable to conclude an international tin agreement on the lines set out in the report," the official announcement said. The group has forwarded to the member governments a recommendation that after certain preparatory steps have been taken the governments should be asked to inform the secretary whether they would be disposed to enter into an agreement on the broad lines proposed and are willing to attend a conference to put the agreement into final form and to conclude it. If a sufficient number of affirmative replies is received, an inter-governmental tin conference will be convened next spring.

It was unofficially reported that the group made no proposal which would increase tin production in the Far East; it did not discuss world prices, except within the framework of the proposed inter-governmental agreement; and did not place any particular stress on tin as a strategic commodity beyond considering the metal as one of the several commodities in the stockpiling of the United States.

Metal Price Averages For October

(Cents per pound)

Electrolytic Copper, del. Conn.	23.500
Lead, St. Louis	19.325
Prime, Western Zinc, E. St. Louis	15.173
Straits Tin, New York	103.000
Primary Aluminum Ingots, del.	16.846
Antimony, f.o.b. Laredo, Tex.	37.423
Nickel, f.o.b. refinery	40.000
Silver, New York	77.226

Aluminum — Shipments of aluminum wrought products during September amounted to 131 million pounds, 3 per cent lower than the 135 million pounds shipped in August, according to the Bureau of the Census. September shipments were 10 per cent higher than the 119 million pounds recorded in the like 1947 month. Total shipments for the first nine months of 1948 came to 1246 million pounds, considerably above the 989 million pounds shipped in the same period of 1947.

The decline in shipments during September was accounted for by decreased shipments of extruded shapes, tube blooms and tubing, which totaled 11 million pounds compared to 14 million pounds shipped in August, and of rolled structural shapes, rods, bar and wire, which totaled 13 million pounds compared to 15 million pounds shipped in August. The balance of the September shipments consisted of 105 million pounds of plate, sheet and strip, slightly higher than the August shipments; and 1.6 million pounds of powder, flake and paste.

Silver — Domestic silver prices dropped 2.75 cents an ounce at the close of October due to heavy offerings of foreign metal and reduced demand from silverware manufacturers. The market at 74.75c an ounce is the lowest since Sept. 1.

Reynolds Enters New Field

Louisville, Ky. — Reynolds Metals Co. has entered the architectural field with a complete line of standard shapes in extruded aluminum. "Standard architectural shapes now available include thresholds; window sills, jambs, mouldings and stools; handrails with balusters and finishing shapes; base mouldings; copings; facia and gravel stops. Orders for these items are now being scheduled for early delivery," David P. Reynold, vice president, said.

After Jan. 1, these items will be stocked by a nationwide distributor organization.

Electrical Wire Prices Rise

New York—United States Rubber Co. has announced increases of from 5 to 10 per cent in prices of electrical wire and cable to offset the rising costs of labor and materials. The increases became effective Nov. 1.

Prices for copper and aluminum building wire, service entrance cable and nonmetallic sheathed cable were raised 5 per cent, while prices for lead encased cables have been raised 10 per cent, C. W. Higbee, manager of the wire and cable department, said. Copper and aluminum building wire, used to wire homes and industrial buildings, represent the largest volume lines.

The increases are the direct result of raw materials costs which, in some cases, have tripled since before the war. These advances, coupled with sharply higher labor and production costs, have been too great to allow them to be fully absorbed in selling prices, Mr. Higbee said.

Brass Firm Restricts Bookings

Waterbury, Conn.—Effective on all new business dated Oct. 28th and until further notice, fully specified orders for all mill products of the American Brass Co. will be accepted and entered subject to the prices and terms prevailing on the date of shipment. Because of uncertain conditions pertaining to raw materials, the company will enter for production only such orders as it can schedule for shipment within a 60-day period. Any orders specified for shipment beyond 60 days and those which cannot be scheduled for shipment within 60 days will be entered at such time as the company can ship within a 60-day period, at terms of sale in effect on date of entry.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50-18.00c.

Zinc: Prime western 15.50c, brass special 15.75c, intermediate 16.00c, East St. Louis; high grade 16.50c, delivered.

Lead: Common 21.30-21.35c, chemical and corroding 21.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type 25.25-25.50c; No. 12 foundry alloy (No. 2 grade) 24.50-25.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 26.25-26.75c; grade 2, 25.25-25.75c; grade 3, 24.25-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.: "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.90, del.; special or patented shapes, $2.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.
Silver: Open market, New York, 74.75c per ounce.
Platinum: $93-$96 per ounce.
Palladium: $24 per troy ounce.
Iridium: $110-$115 per troy ounce.
Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, fob mill)

Sheet: Copper 37.18; yellow brass 33.75; commercial bronze, 95%, 37.11; 90%, 36.63; red brass, 85%, 35.64; 80%, 35.16; best quality, 84.63; nickel silver, 18%, 46.41; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.03; cold drawn 34.28; yellow brass, free cutting, 33.44; commercial bronze, 95% 36.80; 90% 36.32; red brass, 85% 35.33; 80% 34.85.

Seamless Tubing: Copper 37.22; yellow brass 36.76; commercial bronze 90% 39.29; red brass 85% 38.55; 80% 38.07.

Wire: Yellow brass 34.04; commercial bronze, 95% 37.40; 90% 36.92; red brass, 85% 35.93, 80% 35.46; best quality brass 34.92.

Copper Wire: Bare, soft, fob eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, fob eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, l.c.l. 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l. (Two producers quote 1-cent per pound lower.)

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $27.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $27.25 per cwt; cut coils, $23.00. Traps and Bends: List price plus 80%.

ZINC

Sheets, 20.00-20.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 18.75-19.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 17.75-18.50c; over 12-in., 18.75-19.50c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb., 35.00-36.00c

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. Avg.	23.50	19.325	15.173	103.00	16.846	37.423	40.00	77.226
Sept. Avg.	23.50	19.325	15.00	103.00	16.50	35.00	40.00	75.284
Oct. 1	23.50	19.30-19.35	15.00	103.00	16.00-17.00	35.00	40.00	76.50
Oct. 4	23.50	19.30-19.35	15.00	103.00	16.00-17.00	35.00	40.00	77.00
Oct. 5	23.50	19.30-19.35	15.00	103.00	16.00-17.00	35.00	40.00	77.25
Oct. 6-9	23.50	19.30-19.35	15.00	103.00	16.00-17.00	35.00	40.00	77.50
Oct. 11-18	23.50	19.30-19.35	15.00	103.00	17.00	38.50	40.00	77.50
Oct. 19-22	23.50	19.30-19.35	15.00-15.50	103.00	17.00	38.50	40.00	77.50
Oct. 23-27	23.50	19.30-19.35	15.50	103.00	17.00	38.50	40.00	77.50
Oct. 28	23.50	19.30-19.35	15.50	103.00	17.00	38.50	40.00	76.25
Oct. 29-30	23.50	19.30-19.35	15.50	103.00	17.00	38.50	40.00	74.75
Nov. 1-4	23.50	21.30-21.35	15.50	103.00	17.00	38.50	40.00	74.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.
Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.00c, fob Niagara Falls, N. Y.
Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb, or 500-lb bbl, 24.50c, fob Cleveland, freight allowed on barrels, or 3 or more kegs.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 39.25c, fob Cleveland; 39.00c, Detroit; 38.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl., 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, Wis.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 23.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.000	17.750	17.125
Commercial Bronze			
95%	20.125	19.875	19.375
90%	19.750	19.500	19.000
Red brass			
85%	19.750	19.500	19.000
80%	19.500	19.250	18.750
Best Quality (71-79%)	19.000	18.750	18.250
Muntz Metal	17.250	17.000	16.500
Nickel, silver, 10% ..	19.625	19.375	9.813
Phos. bronze, A.	22.625	22.375	21.875
Naval brass	17.750	17.500	17.000
Manganese bronze ...	17.750	17.500	16.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.75, No. 2 copper 18.75, light copper 17.75, composition red brass 17.00, auto radiators 14.00, heavy yellow brass 12.50-12.75, brass pipe, 13.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.50-20.75, No. 2 copper 19.50-19.75, light copper 18.50-18.75, refinery brass (60% copper), per dry copper content 18.50-18.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 18.00-18.50, No. 2 17.00-17.50, light copper 16.00-16.50, No. 1 composition red brass 15.00-15.25, No. 1 composition turnings 14.50-14.75, mixed brass turnings 8.50-8.75, new brass clippings 14.00-15.00, No. 1 brass rod turnings 11.00-11.50, light brass 8.00-8.50, heavy yellow brass 10.50-10.75, new brass rod ends 11.50-12.00, auto radiators, unsweated 12.25-12.50, cocks and faucets 12.00-12.25, brass pipe 12.00-12.25.

Lead: Heavy 18.50-19.00, battery plates 12.25-12.75, linotype and stereotype 18.00-18.50, electrotype 16.50-17.00, mixed babbitt 15.75-16.25, solder joints, 19.75-20.25.

Zinc: Old zinc 7.75-8.25, new die cast scrap 7.75-8.25, old die cast scrap 5.00-5.50.
Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.
Aluminum: Clippings 2S 15.00-15.50, old sheets 11.00-11.50, crankcase 11.00-11.50, borings and turnings 6.00-6.50, pistons, free of struts, 11.00-11.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 Bundles	42.50-43.00
No. 3 Bundles	40.50-41.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	37.50-38.00
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	39.50-40.00
Bar Crops and Plate	49.00-50.00
Low Phos. Steel	49.50-50.00
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	65.00-66.00
Machinery Cast	72.00-73.00
Charging Box Cast	61.00-62.00
Heavy Breakable Cast.	60.00-61.00
Malleable	74.00-75.00
Brake Shoe	57.50-58.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00
R.R. Malleable	75.00-80.00
Axles	55.25-56.25
Rails, Rerolling	59.00-60.00
Rails, Random Lengths	55.00-57.00
Rails, 3 ft and under	62.00-63.00
Rails, 18 in. and under	63.00-64.00
Railroad Specialties	60.25-61.25
Uncut Tires	54.50-55.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings.	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	75.00-77.00
Charging Box Cast	64.00-66.00
Stove Plate	65.00-67.00
Heavy Breakable Cast.	55.00-60.00
Unstripped Motor Blocks	62.00-64.00
Malleable	79.00-81.00
Brake Shoes	53.00-55.00
Clean Auto Cast	75.00-77.00
No. 1 Wheels	64.00-66.00
Burnt Cast	57.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	80.00-82.00
Rails, Rerolling	60.00-66.00
Rails, Random Lengths	60.00-63.00
Rails, 3 ft and under	63.00-66.00
Cast Steel	57.00-59.00
Railroad Specialties	60.00-62.00
Uncut Tires	58.00-59.00
Angles, Splice Bars	61.00-64.00

* Plus applicable freight springboard on earmarked material.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings.	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings.	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings.	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	63.00
Charging Box Cast	53.00
Heavy Breakable Cast.	59.00
Stove Plate	55.00
Unstripped Motor Blocks	56.00
Brake Shoes	50.00
Clean Auto Cast	63.00
Drop Broken Cast	71.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	75.00
Rails, Rerolling	62.00
Rails, Random Lengths	58.00
Rails, 18 in. and under	63.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast.	54.00-59.00
Clean Auto Cast	60.00-65.00

BUFFALO

No. 1 Heavy Melt. Steel	$48.00-49.00
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	36.75-37.25
Mixed Borings, Turnings	36.75-37.25
Cast Iron Borings	37.75-38.25
Short Shovel Turnings.	38.75-39.25
Low Phos.	49.00-51.00

Cast Iron Grades

Mixed Cupola	65.50-66.50
No. 1 Cupola	68.00-69.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	61.00-62.00
Railroad Specialties	60.00-61.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-45.50
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	37.50
Mixed Borings, Turnings	37.50
Short Shovel Turnings.	38.50
Bar Crop and Plate	49.00-51.00
Punchings & Plate Scrap	49.00-51.00
Cut Structurals	49.00-51.00
Elec. Furnace Bundles.	47.00-48.00
Heavy Turnings	45.50-46.50
No. 1 Chemical Borings	46.00-46.50

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	67.00-68.00
Charging Box Cast	64.00-65.00
Heavy Breakable Cast.	62.00-62.50
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	69.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings.	30.00-31.50
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles.	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	57.00-58.00
Heavy Breakable	58.00
Unstripped Motor Blocks	53.50-54.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$38.90
No. 2 Heavy Melt. Steel	34.40
No. 1 Bundles	34.40
No. 1 Busheling	34.40
Machine Shop Turnings	29.90
Mixed Borings, Turnings	29.90
Short Shovel Turnings.	31.90
Bar Crops and Plate	40.00-41.00
Punchings & Plate Scrap	40.00-41.00
Chemical Borings	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast.	55.00-58.00
Stove Plate	54.00-55.00
Unstripped Motor Blocks	50.00-52.00
Clean Auto Cast	54.00-56.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	38.50-39.00
Cast Iron Borings	37.50-38.00
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles.	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	70.00-71.00
Clean Auto Cast	70.00-71.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	45.00-46.00
Malleable	81.00-82.00
Rails, Rerolling	68.00-69.00
Rails, Random Lengths	59.00-60.00
Rails, 3 ft and under.	60.00-61.00
Rails, 18 in. and under	63.00-64.00
Railroad Specialties	55.50-56.50
Angles, Splice Bars	56.50-57.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$44.00-45.00
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	35.00-36.00
Short Shovel Turnings.	36.50-37.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-66.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast.	59.00-60.00
Brake Shoes	60.00-61.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R. R. Malleable	71.00-72.00
Rails, Rerolling	63.00-65.00
Rails, Random Lengths	56.00-59.00
Rails, 3 ft and under.	60.00-61.00
Uncut Tires	51.00-52.00
Angles, Splice Bars	54.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*27.50
No. 2 Heavy Melt Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-65.00

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling	27.50
Nos. 1 & 2 Bundles	27.50
No. 3 Bundles	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	50.00
Heavy Breakable Cast.	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars.	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
Nos. 1 & 2 Bundles	27.50
Machine Shop Turnings	20.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	50.00-55.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	48.00-50.00
No. 2 Cast	44.00-45.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

Sheets, Strip . . .

Sheet Prices, Page 154

Prospect of increased allocations causes concern to producers and metalworking companies

Pittsburgh — Steel producers and metalworking companies are concerned over the possibility that steel distribution will be placed under strict allocation control as result of the Democratic victory. It was pointed out that should this develop, the automotive industry would be hardest hit in regard to steel supplies. At present, the voluntary allocation program is absorbing up to 10 per cent total steel output and it appears that this proportion may be substantially increased over coming months, particularly for defense requirements.

Follansbee Steel Corp., Oct. 30, advanced silicon sheet prices at its Follansbee, W. Va., and Toronto, O., plants $25 per ton to the following levels: Motor, $7.95; dynamo special, $8.65; transformer 72, $9.15; 65, $9.85; 58, $10.55; and 52, $11.35.

Wheeling Steel Corp. revised its tables on coating extras for galvanized sheet products in line with similar action taken by Carnegie-Illinois Steel Corp. Steel interests are studying recent upward adjustments in extras for hot-rolled sheets and strip initiated by Great Lakes and Weirton Steel last month. However, a survey of producers here indicates no immediate action is in the offing.

Boston—Pattern of flat-rolled steel distribution is becoming more confused, complicating users' production schedules to a greater degree in months ahead. For the most part, only alloys, tin mill products and electrical sheets are allocated for the full first quarter period with additional quotas being established on a monthly basis, restricted now to January. There are no indications pointing to any improvement in flat-rolled tonnage applicable to new volume in any category. Far behind are producers on varied sheet and strip tonnage, one mill lagging with at least 1000 tons of cold-rolled strip originally scheduled for September delivery and back. This and other delinquent tonnage is still on mill books in most instances with consumers showing no inclination to withdraw. Thus, confronted with carryovers and inability to schedule beyond normal lead time for next quarter, distribution is becoming increasingly confused. Requirements for practice bombs mount in the armament program with two New England shops, quoting on part of the Navy inquiries, accounting for several hundred thousand tons, from small to 500-pound units. Continued confusion growing out of base price, extra and discount differences prevails in stainless.

New York—While sheet sellers will move cautiously in setting up quotas for shipment beyond the end of the year, particularly in view of the uncertainty as to whether or not the law governing allocations will be extended beyond the end of February, some leading sellers have set up allocations for January. These allocations, however, will involve little new tonnage, because of arrearages that will have to be carried over into the

new year. Certain producers, in fact, will be able to supply no new tonnage, one interest, for instance, estimating that its carryover will actually represent five to six weeks' production.

Galvanized sheet sellers generally have advanced their extras as a result of the increase in zinc. One leading eastern producer is now quoting 9 to 14 gages inclusive at 29.00c, as against 26.00c; 15 to 23 gages, 55.00c against 50.00c; 24 to 27 gages, 83.00c as against 75.00c; and 28 to 32 gages, $1.15 as against $1.05. This appears to be about in line with revisions in other quarters.

Chicago — Lessening demand for sheets and strip in some quarters is noted locally, some of the factors being temporary in nature, as for example reduced purchases during inventory-taking, while others have a more permanent aspect. This easing in pressure is entirely too little to indicate near-term prospects for demand-supply balance, but is the cause of some recent resistance to gray market offerings. Among consumers goods, it is reported that some washing machine and refrigerator producers are reducing output. Demand for electric ranges and dishwashers, however, remains strong. Situation with a local manufacturer of perforated and stamped steel products seems fairly typical of the area's consumers of sheets and light plates when he says that only about half of his plant's capacity can be utilized because of the shortage in these products. Normally, the company is supplied with 85 per cent of its requirements from mills and 15 per cent from warehouses, but in the current era the proportion of mill tonnage has declined substantially, forcing the company to intensify its demands on warehouses.

Cleveland — Possibly reflecting an easing in pressure for new railroad freight cars (see STEEL, Nov. 1, p. 51), one steel company has been notified of a 10 per cent reduction in the amount of galvanized sheets it will be expected to provide for the freight car building program. More than offsetting this reduction, however, is an increase in the tonnage of galvanized sheets this company is expected to make available for the warm air heating and atomic energy program. All flat-rolled carbon steel products remain in tight supply.

Cincinnati — District sheet mills are doing preliminary work on first-quarter quotas while facing terrific pressure for tonnage. Effects of the carryover, which mills are trying to reduce, and voluntary allocations programs on those quotas are not yet determined. District mills raised galvanized sheet prices automatically in accord with the recent zinc price advance.

Birmingham — Reports indicate additional pressure or plates on order books in the district, but sheet producers are taking nothing in sizable quantities over and above the usual routine bookings. Insistence for sheets has led, as a matter of fact, to strained relations in several quarters, but apparently the distribution pattern will continue unchanged. Meanwhile, the pinch is getting somewhat tighter.

Los Angeles—Notwithstanding the substantial additions being made to

western production capacity, sheet consumers report an extremely tight situation, and expect increasing difficulty rather than improvement until at least mid-1949. The gray market is active among the metalworking firms more starved for steel. Nevertheless many buyers are disposed to show more discrimination than in past weeks. They are looking over their dollars more closely, and re-evaluating those needs which can be met only by paying premium prices.

St. Louis — Automatic increase clauses in sales contracts covering the cost of recent zinc rises have gone into effect among most galvanized sheetmakers here, averaging around $1 a ton. Galvanized prices here usually run $4 over the Chicago market, but the principal product is packaged barn sheets. Sheet output continues to rise gradually as Granite City Steel Co.'s new cold reduction mill overcomes adjustment difficulties. Output of the tandem mill in October, for example, was 18,000 tons as compared to 13,000 in September. Mills continue to have trouble staying more than even on scrap, shipments of which are slow under the formula price schedule. Sheet producers still hope to be current by the yearend and have held down first-quarter commitments as an extra safety margin. Overall sheet demand is unabating, although some easing of pressure among electrical appliance manufacturers is noted.

Wire . . .

Wire Prices, Page 155

Boston—While suspensions in deliveries through December are more numerous and delivery pressure is easing in some directions, overall demand for wire products has not slackened materially. Upholstery and music wire are easier, but all sizes and grades of heading wire are difficult to obtain in volume wanted. Additional tonnage of finished wire and rods has been withdrawn from this area, and inability of consumers to fill these gaps contributes toward general tight wire situation, notably in nails. Rod supply is more or less static, but generally is below requirements with mill schedules keyed to what is available for finishing rather than what many consumers actually require. Specialties and automotive volume holds at a high level.

Cleveland—Farm fence needs are so great that the approach of the winter season has not brought a seasonal decline in pressure for such products. Because of economic considerations farmers apparently are favoring barbed wire over woven fence, with the result the former product is in particularly strong demand. One producer is now taking orders for first quarter of 1949.

Demand for nails shows no let-up. Prices quoted by one leading producer remain steady, no change being made in galvanized nails and staples even though zinc prices rose recently.

Birmingham — Although wire demand fluctuates from week to week in some instances, the overall picture is virtually unchanged. All specifications in wire, including nails and fencing, remain acutely scarce. Somewhat less complaint is heard from wire processors, however.

Plates . . .

Plate Prices, Page 155

New York—Plate producers have begun setting up quotas for shipment beyond the end of the year, but in no case have they made allocations beyond February, except in relation to certain defense work and certified projects. In fact, most have not gone beyond January on noncertified tonnage and at least two haven't even gone that far, although they will probably act in a few days. As usual there will be some carryover at the end of this quarter, which will restrict the amount of new tonnage shipped in January. In general there is no easing in demand, despite the fact that production has increased slightly.

Boston—With certified allocations due to expire under law 395 at the end of February, that date will arrive with considerable tonnage of plates and other finished products unshipped and unscheduled. This volume missed normal leadtime due to delays in definite assignment of certified orders and with plate deliveries already six weeks to two months behind in some cases, disposition of late certified steel is uncertain.

Philadelphia — Shortage of plates continues to cause many consumers to go into the gray market and, where arrangements can be made, to set up conversion deals. However, with premiums often amounting to 8 cents a pound and higher, consumers engaged in work where steel is the major cost factor, are inclined to go slowly and, in fact, set very definite limits as to how high they will go on price. This accounts for gray market prices on plates being lower than on sheets, despite the fact that one product is about as scarce as the other. The gray market on plates is more flourishing where a fabricator is able to get into specialties, with steel not too important a factor in the overall cost of the finished product. Conversion work is still pressing, one eastern plate mill with surplus rolling facilities being booked up solidly on conversion tonnage throughout the first quarter, and turning away business.

Birmingham — Plate users, especially those without regular supply source and not within the voluntary allocation plan, are finding the going increasingly tough. Some larger plate users, especially those within the territory, also complain of inability to meet current contracts because of the tightening supply situation.

Los Angeles — Demand is far out of balance with supply, with many users finding plates more difficult to obtain than any other steel product. Plates lighter than ¼ inch are in shortest supply. Suspension of operations in some of the strikebound major oil fields has not affected plate demand, for equipment fabricators are building up their stocks for anticipated heavy future needs.

Seattle—Fabricators are making the best of a critical supply situation confining operations to jobs involving small tonnages of plates. In some cases substitutions are necessary. No large projects are up for figures but a fair run of small contracts for boilers and tanks is reported.

Steel Bars . . .

Bar Prices, Page 154

Pittsburgh—No let-up in pressure for urgent delivery of cold-finished carbon and alloy bars is noted here. Some order backlogs extend into fourth quarter of 1949 on sizes under 5/8-inch in both carbon and alloy. Some of this tonnage may represent duplicate ordering, but sellers contend they have closely scrutinized all orders with the intention of weeding out such type business. Most interests report reduction in mill allotments of recent months has resulted in further curtailment of operating schedules. In some instances operations are below 70 per cent of capacity, although this is not a correct indication of total production in comparison with prewar due to sharp expansion in production facilities since that time.

Wyckoff Steel Co. effective Nov. 1 increased size extras for alloy cold-finished flats from 15 to 70 cents per 100 pounds. Company did not revise thickness or width ranges in its size extra table for alloy flats. It will be recalled that width and thickness ranges for hot-rolled alloy flats were revised by Carnegie - Illinois Steel Corp. and other producers to coincide more closely to size extra price base on alloy rounds and squares in respect to square footage rolled. Up to late last week, most cold-finished alloy bar producers had not published their new size extras for flats, although nearly all interests have revised the grade extras for alloy cold-finished bars in line with adjustments initiated by Carnegie.

New York—Except in cold-drawn carbon and hot and cold alloy bars, producers have not as yet set up allocations for beyond January. Indications are that few, if any, sellers of hot carbon bars will further extend quotas for the time being and possibly none for the entire first quarter until after the outlook has been clarified with respect to the termination of Public Law 395. At present it is scheduled to expire Feb. 28, although there is a possibility of an extension. Most consumers of hot carbon bars expect first quarter quotas to be no heavier than for the current quarter, if as heavy. This applies to non-certified as well as certified buyers.

One possibility for relief for non-certified consumers hinges on the expiration of voluntary allocations in most lines after February. If it is clear that most of these programs will wind up by the end of February, there may be a somewhat freer amount of tonnage for general distribution. At the same time a tightening of the defense program and possibly a greater emphasis on foreign aid may offset easing in these other directions, with a result that non-certified buyers would be in no better position.

Philadelphia—Hot carbon bar sellers are moving cautiously in setting up quotas for shipment beyond the end of this year. Not only is there the direct question as to what is going to happen to Public Law 395, under which voluntary allotment programs have been set up until the end of February, but the consideration as to what may develop with respect

to mandatory controls of possibly greater scope than the present voluntary certifications, now that the Democratic administration has been re-elected for another four years, with Democratic majorities in both branches of Congress for at least another two years. Most producers to date have not set up quotas beyond January. On cold-drawn carbon and hot and cold alloy bars, sellers are disposed to book further ahead.

Frankford Arsenal closed bids Nov. 3 on 30,000,000 rounds of ball cartridges and will open bids Nov. 10 on 170 tons of special bar steel for armor piercing bullet cores and on Nov. 22 on 50,150 tungsten carbide cores.

Boston — More alloy tonnage for armament is included in first quarter allocations, although carbon die-rolled barrel blanks are being bought in heavier volume by the Springfield armory. Some carbon bar volume has been entered for first quarter, but total of hot-rolled is down. Cold finishing mills are hard pressed for balance in stocks of hot bars; with cold-finished stock sold ahead farther than other grades on the average, further revisions in cold-drawn schedules are indicated in first quarter.

Chicago—While overall bar demand is far in excess of ability to produce, in scattered spots supply is beginning to catch up. One forging company, despite its heavy business volume, reports its raw stock inventories are showing some increases. This situation is by no means general since most consuming industries expect an even further tightening in supply after the first of the year when some producers will cut quotas to make up for carryovers and to satisfy allocation requirements. However, since shortages first developed purchasing men have been getting more and more pessimistic as to the prospects for more steel.

Tubular Goods . . .

Tubular Goods Prices, Page 155

Chicago — When steel supply gets plentiful enough to quash the conversion business in pipe and tubing, a good many middlemen in these deals will breathe a sigh of relief. One converter, for example, would like to enter the competitive market with his products but can't because of the tight semifinished steel situation. At present a few large consumers virtually tie up the company's capacity and leave the firm dependent upon these customers' ability to get steel for processing. Sudden withdrawal of this business would leave the company high and dry, with no steel supply, no customers and a very large investment in plant and equipment. From the consumers' angle, however, conversion spells a fairly reasonable way out of the shortage. "Blue chip" companies appear able to get semifinished more easily than some processors, and for charges far below what they would have to pay in the gray market they are able to get finished material. The costs naturally run higher than if the product were obtained by more direct methods, but this expense, some say, results from cross-hauling and other necessary incidentals rather than from excessive conversion charges.

St. Louis — Pipemakers have opened first-quarter books and rolling schedules are already practically filled. Desire of jobbers to increase inventories has maintained the pressure on pipe which might have been expected to ease with end of the building season. There was heavy carryover from the third and fourth quarters. This, plus the doubtful raw materials situation which prompted caution in volume of new orders taken, has limited first-quarter allotments. Pipe consumers here anticipate a $1 price rise on galvanized pipe to offset the recent 1-2 cent rise in zinc. The leading mill is considering it, but no rise has been announced so far. Mills have been at 95 to 98 per cent pipe capacity several months.

Los Angeles — Demand has not let up in the slightest, with some firms estimating it will take them 18 months to catch up with new orders. Wherever possible, oil producers and equipment fabricators are building up stocks for use when strike-bound fields are able to resume full operation. Only bright spot in the supply picture is welded tubing, of which some types are available in tonnages ample to meet requirements.

Seattle—Cast iron pipe agencies are more concerned with speeding deliveries on the substantial tonnages already booked than in seeking new business. Several important shipments are aboard strike-bound vessels.

Structural Shapes . . .

Structural Shape Prices, Page 155

Chicago—Acting as a deterrent to many prospective builders is the tight materials supply situation and the high cost of construction. Such jobs as are taken by fabricators generally are those in which relatively little steel is specified so as to stretch supplies over a wider area. Demand for new plants and other types of buildings, however, continues well in excess of the building industry's ability to comply and suppliers of component parts are also under heavy pressure for their products.

The local situation in steel windows exemplifies other industries which supply the building trades. One company reports that while its shipments and order volume of steel sash are greater than ever before, its order backlog is also greater than it was the beginning of the year. During this year, improved handling methods have enabled delivery schedules to be improved, residential casements now being available in from 6 to 8 weeks and industrial windows in from 6 to 12 weeks, depending upon type. Previous delivery delay averaged from 12 to 14 weeks, with a few types being available in 8 weeks. The order backlog, despite its present comfortable size, is smaller than it was at one time, largely because of the company's efforts to weed out multiple orders. To insure themselves of steel sash, many contractors were placing duplicate orders with several producers, thus giving an erroneous slant on the size of actual demand. Diligent attention to keeping delivery promises has been responsible to a large measure in eliminating much of this "water" from the order books.

Playing a substantial role in this company's producing record has been its mill steel suppliers. Obtainment of the special shapes required has not been as much of a chore, the company says, as would be true if it were a large user of sheets or bars. While more steel could be used if it were available, the labor shortage rather than that of steel is the major factor precluding increased production. To ease this shortage, the company has been recruiting workers from another city and has been transporting them to and from the plant for a nominal fee so that they are not subjected to the area's severe housing pinch.

New York—Following recent active buying, involving especially government work and even more particularly New York state bridge work, the structural market here has slowed up. There are still several fair sized jobs under active contemplation, but new orders are light. Leading fabricating shops have substantial backlogs, with two at least having nothing to offer under six months. In fact, some fabricators are more concerned about their ability to obtain steel for what they have than they are about taking on new work.

Boston — With some December allocations nearly halved from original levels, structural shops are seeking fill-in tonnage to meet commitments with indifferent success. New

volume up for estimates, while including 1000 tons under one alternate for a state office building, Hartford, Conn., is slack, on both private and public work. Outlook for additional plain material next quarter is doubtful; mills are reluctant to go beyond January in initial allocation schedules. Substantial share of structural output is going to certified program requirements and a clarification of future distribution covering these must be forthcoming before February and March are given definite consideration.

Philadelphia — Structural demand continues steady at the rather restricted volume of the past several weeks, with award of 1600 tons for three Woolworth stores through the Turner Construction Co. outstanding. Fabricating shops have comfortable backlogs, and appear primarily concerned over the problem of obtaining sufficient steel to maintain good operating schedules.

Pennsylvania Railroad closed bids Nov. 8 on structural steel, contract 124-1948.

Birmingham — Shape demand is somewhat spotty but fairly heavy in the aggregate. Construction under consideration, including new viaduct and bridge work, is expected to bolster demand early next year.

Los Angeles — Large-scale public and private construction projects, either underway or in the bid stage, promise to thin out whatever supplies of structural shapes are available. Small shapes and wide flange sections are in great demand, and can be had only in small quantities.

Seattle—Fabricating plants have fair backlogs and are trying to maintain normal operations in the face of increased material shortages. Tonnage held up in idle intercoastal ships is critically needed for current jobs and the situation is one of anxiety and grief. Mill allocations are now coming by rail at increased cost and managers hope for resumption of water service which handles heavy steel items in large volume.

No awards have been announced for the Portland telephone building, 2000 tons, or for the Seattle Federal reserve bank, 1140 tons.

Stainless-Clad Extras Revised

Conshohocken, Pa. — Alan Wood Steel Co., this city, has made a substantial reduction in quantity extras on its stainless-clad steel. New schedules became effective Oct. 22.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 154

Los Angeles — Despite heavy construction programs, reinforcing bars are in moderate supply, particularly in rail steel grades. Recent increase in Mexican import duties made additional tonnages available for a time.

Seattle—Rolling mills report capacity operations and heavy backlogs. New business is being offered without solicitation and mills are making every effort to speed deliveries on current contracts and to accommodate regular customers. Reinforcing bar orders for the first quarter are being taken on a limited scale, much pending business to overlap into 1949.

Tin Plate . . .

Tin Plate Prices, Page 155

Washington — Office of International Trade, Department of Commerce, has announced that the overall quota of 113,000 tons of priority rated tin plate for the first quarter of 1949 will be distributed as follows: 2,840 tons to ECA countries, 6945 tons to ECA territories, 400 tons to Spain and 171 tons to reserves for contingency. Quotas to ECA countries are as follows in tons: Netherlands. 10,200; Norway, 5800; Belgium-Luxemburg, 3900; Portugal 3300; Sweden, 3500; Switzerland, 3350; France, 3000; Italy, 3000; Denmark, 2700; Austria, 1000; Turkey, 1000; Greece, 1000; Ireland, 400; Iceland, 120; and Trieste, 70.

Quotas to ECA territories are as follows in tons: French North Africa, 2200; Netherlands Indies, 1400; Madagascar-Reunion, 425; French Indochina, 275; Portuguese African Territory (Angola), 250; French West Africa, 175; Belgian Congo, 125; French Oceania-New Caledonia, 50; British West Indies, 25; and French Equatorial Africa, 20.

Los Angeles — Although the situation is still subject to rapid changes, supply and demand are coming more nearly into balance. Considerable relief is in sight as hot-dip tinning starts underway at Columbia Steel Co.'s new Pittsburg, Calif., mill. Full production of electrolytic is expected by the first quarter. Indicating that at least some supplies are becoming available in other districts, one tin plate user reports it has received its first eastern carload since 1941.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 155

Pittsburgh—No revision in prices for fasteners is reported by industry members. Some sellers continue to quote prices on old price basis of Pittsburgh, Cleveland, Chicago and Birmingham, others at point of production with proviso they reserve right to meet competition. Most producers report mill steel shipments continue to fall below immediate needs, making it impossible to operate machines on full five-day per week schedule.

Refractories . . .

Refractories Prices, Page 156

Pittsburgh — Refractory brick demand shows no signs of easing, and includes full range of brick classifications. Relining programs for such overworked blast furnaces, coke ovens and open hearths continues unabated, while considerable volume of new orders also is represented in scheduled expansion of additional coke oven and open-hearth facilities. Ladle brick producers have been unable to make much headway against order backlogs, with some consumers still forced to use substitutions. Supply of ladle brick is expected to remain very tight as long as steel output remains at current levels. Deliveries are extended 6 months and more on super-duty clay brick and special shape silica bricks. Refractory brick market has been devoid of price action in recent weeks.

Scrap . . .

Scrap Prices, Page 160

Threat of price control under Democratic administration firms present price levels

Pittsburgh—Scrap trade authorities indulged in considerable speculation in respect to possibilities of industry-wide price control following the Democratic victory last week. Even prior to this development, some leading brokers and consumers contended pressure for high prices had run its course and believed lower price levels were probable early next year. Threat of price control will act as an additional factor in at least holding prices at current levels because a further upturn in prices at this time would only encourage governmental action.

Jones & Laughlin Steel Corp. has been added to the list of major consumers who have contracted for German scrap. Scheduled increases in shipments of this scrap over coming months, plus the relatively good inventory position among major consumers, have been important factors in easing pressure for higher prices during the past two months. This situation has enabled mills to be more selective in purchasing scrap on the basis of quality as well as in making commitments for remote material involving substantial freight absorption. One mill is no longer paying more than $2.50 springboard for open-hearth grades, while another is restricting its purchases to $1 freight absorption on turnings. However, the inventory position of the smaller mills is still well below normal for this period of the year and, consequently, these interests still are reaching out for remote scrap involving springboard in excess of $2.50.

New York—Scrap brokers' buying prices continue unchanged throughout the list. Speculation exists as to the possible effect of recent elections on government business policies. Should demand continue as strong as now indicated, some believe that return to price fixing by the government will eventually develop. They doubt, however, that this would come for at least another few months and that, if it should come, it would probably in most instances mean a freezing of current levels, certainly no return to the old OPA prices, for the reason that costs generally have advanced sharply since that time. Certain trade leaders believe that the industry might escape price fixing entirely if every effort is made to maintain prices at a reasonable level.

Philadelphia — While the scrap trade is speculating on the possibility of an eventual return to government price control, melting steel prices continue firm, with some leading consumers indicating a desire to purchase tonnage for first quarter shipment at current levels. The only revision in scrap prices generally here is a slight easing in the principal low phos grades with a spread of $49 to $51 delivered. Movement of scrap continues to be retarded by scarcity of gondolas.

Cleveland—Prices and flow of open-hearth and foundry scrap remained steady last week. Following the Truman administration's election victory there was considerable discussion as to whether price controls might be enacted on scrap early next year.

To maintain the flow of scrap needed to support the current high rate of steel ingot production and to build inventories for winter, mills are watching closely to see they get their share of production scrap from metalworking plants to which they supply steel.

It was reported that one dealer had begun to hold back scrap until after the close of this year because of income tax considerations. However, production scrap earmarked for movement from metalworking plants to steel mills will continue to flow.

Interest in foreign scrap is being heightened by reports of its high quality. In commenting on a recent shipment of rubble scrap one buyer said it was the best material he had seen since before the war. Some months ago there was considerable dissatisfaction with battlefield scrap brought in from foreign countries.

Detroit — Scrap trading is firm at the formula level, with additional pressure noted for channeling or earmarking tonnages for specific mills. McLouth Steel Corp. is negotiating for scrap supplies for its proposed down-river electric furnace plant, scheduled to begin operations early next year. Four 60-ton electrics will have ultimate capacity for 30,000 tons of ingots monthly. Trade observers here believe the company will have to move extremely fast to get the melting under way before spring, since as yet there is not even a siding into the plant site.

Novel feature of the financing of the project is that $8 million worth of second-mortgage 4 per cent 10-year notes have been assumed by principal customers, including Ford, General Motors, Briggs and American Metal Products. For the present McLouth's requirements for hot rolled bars to be processed into cold-finished strip are being furnished by U. S. Steel, following withdrawal of Great Lakes Steel Corp. from the business last spring.

Buffalo—Although some post-election nervousness was apparent in the scrap market, there were no immediate indications that the prolonged stalemate in activity of any consequence would be broken between dealers and leading mills. While talk indicated a bit of jitters over the election returns, dealers still refused to accept new contracts at the prevailing rate of $42.25 a ton for No. 1 heavy melting and allied grades. In addition, buying interest from other centers was reported at as high as $2 above prices quoted here. A showdown on the deadlock is expected shortly as old contracts are near completion in many instances.

Reflecting a highly competitive market for supplies, the Norwegian freighter *Svanefjell* arrived here during the week with a consignment of aluminum scrap for the Samuel Greenfield Co. Inc.

Chicago — Scrap people here recovered quickly from the confusion they first felt from the election upset and, in testing their prices, found that mills had not changed their policies and that none of the bearish

attitude that first prevailed in the stock market was in evidence. By and large, however, the metal producing industry will be feeling its way cautiously for some time to come and, as comfortably stocked with scrap as it is now, there seems little chance of any radical change in price from the present levels.

Last week the only price changes reported were in railroad scrap, rerolling and random length rails moving up $2 to a range of $68 to $69 and $59 to $60, respectively, and short lengths 18-inches and under up $1 to a spread of $63 to $64. A test in the railroad melting price of $45 to $46 is in prospect as soon as new lists are issued.

Cincinnati—Scrap prices continue generally unchanged. Comfortable stocks are helping to preserve the formula on open-hearth grades. Good cast and rails are strong, but weakness has developed in wheels. Flow of tonnage is steady with little holding by dealers.

Birmingham — Broker prices on scrap are holding steady. Improvement is noted in some mills' inventories. Yard supplies of scrap are somewhat tighter, a situation that is expected to worsen as the winter season advances.

Los Angeles — Demand for scrap is strong and prices remain steady, the only easiness being shown in No. 1 cupola cast. Current prices range from $50 to $55. Scrap receipts in general are hampered by the shipping strike, with considerable tonnages tied up on idle vessels. Eastern mills are buying here, and one fabricator has been sending all its ship scrap by rail to the East Coast. There is renewed talk of a possible price increase, and some dealers are attempting to accumulate scrap stocks.

Seattle—Receipts of steel scrap are below normal requirements and mills approach the winter season with anxiety as to potential supplies in the next few months. Surplus ships are not being offered and breaking plants are now exhausting their backlogs. Shipments from the country are declining and mills are hardly holding their own with consumption at high levels. The situation was discussed with buyers and dealers recently by representatives of the Institute of Scrap Iron & Steel. Plans for stimulating shipments of scrap were discussed by Edwin C. Barringer, president of the Institute, and Herman D. Moskowitz of New York. The mill price is firm and steady at $27.50 gross, f.o.b. mill.

Foundries report cast iron receipts are sufficient for current requirements, the price averaging betwen $45 and $50 per gross ton, the latter being paid for select lots. Pig iron is being received in larger shipments.

Midvale Strike in 23rd Week

Philadelphia—Strike at the plant of Midvale Co. at Nicetown here is now in its 23rd week, with no immediate indications of settlement. Trouble developed late last May as result of a wage dispute in one department, with a subsequent general walkout in all departments.

Pig Iron . . .

Pig Iron Prices, Page 156

Cleveland—Price of electric furnace silvery pig iron was increased $3 a ton Nov. 1 by Pittsburgh Metallurgical Co., making the new price $84.75 for 14.01-14.50 per cent silicon at Niagara Falls, N. Y. This increase is in line with advances made recently by other iron producers.

New York—District pig iron consumers anticipate a better supply of iron this month, especially with the New England producer getting back into blast, thus relieving some of the pressure on the overall supply. However, district consumers look for further stringency in oven coke, with the probability that the trend will continue tighter until after the turn of the year.

While few foreign importations have been reported to arrive here recently, the general movement from abroad along the eastern seaboard continues well sustained. It is likely, though, that within the next few weeks the trend will be downward. Foreign prices already are a shade easier.

Boston — Production approximates capacity of 500 tons per day at the Everett, Mass., furnace and shipments parallel output. No. 2 foundry will be made until Nov. 15 when the schedule will be switched to malleable. While deliveries are being spread thinly, the more critical emergencies are being met and pig iron supply is more in line with melt at continued high scrap ratios, although there is no chance for most consumers to build inventories. Demand for foreign iron has slackened and a downward break in prices is expected before much new buying develops.

Pittsburgh — Output of castings continues restricted, due primarily to acute pig iron scarcity but also to poor quality coke and limited cast scrap supply. Fact some foundries are seriously considering advisability of purchasing foreign pig iron, at prices around $80 eastern seaboard, is another manifestation of critical pig iron shortage. Blast furnace output is estimated to be falling 10 per cent below capacity because of poor quality coal. However, there is some indication more extensive use of coal-washing facilities will improve coal quality in months ahead. Downward trend in order backlogs among gray iron foundry interests has partially offset general raw material shortage.

Philadelphia — Although pig iron supply is still scarce, there is a slight easing, due to somewhat better domestic production and further arrivals of foreign iron. Recent arrivals of Indian iron, totaling about 5000 tons, are for eastern consumers, including one foundry. A leading district merchant furnace contemplates little change in its foundry melt this month, despite pressure for basic iron.

Buffalo—Despite reports that a number of jobbing foundries find business leveling off at the same time pig iron imports are increasing, leading merchant iron producers claim the current market is among the tightest on record here. Also, it was pointed out that the big melters continue to clamor for deliveries and any letup is among the jobbers. Many foundries are operating far short of capacity because of inadequate iron supplies. A portion of the iron imported at the Seaboard has moved into the local area at what the trade calls fantastic prices. Fabulous prices are reported, too, on some area business.

Cincinnati—Shipments of pig iron have failed to improve, with tonnage from some furnaces lighter than 90 days ago. Supply appears easier for a few melters, but this was ascribed to tapering in demand for certain classes of castings. The district melt has been sagging, but even at present levels more iron is needed to cut the proportion of scrap being used.

Birmingham — Return of a Woodward Iron Co. furnace this week has bolstered merchant iron supplies, but output continues noticeably behind current needs. Increasingly large use of scrap is reported to the extent that the material is available. Pig iron producers thus far have made no move to increase their prices in line with recently announced action elsewhere, but momentary boost is expected.

St. Louis — Missouri-Illinois Furnaces Inc. blew in its No. 2 stack last week after a three-month relining shutdown. Its week's schedule called for shipment of 1400 tons, with probability it will reach 80 per cent of its 1000 ton daily capacity by late November and 100 per cent by Dec. 1. Pig iron allotments to consumers, cut 55 per cent during the repairs, are being gradually restored, with the result several foundries in the area have returned from the four-day to the five-day week—notably stove manufacturers. In the interim Mo-Ill maintained full coke production and now has stockpiled sufficient to keep it out of the open coke market around two months. Normally it buys 20 per cent of its consumption outside. This district's pressure for iron is not expected to drop noticeably, since better supplies will be used initially to reduce scrap in melts. Purchases of imported foreign iron will drop, however. Such metal has been plentiful here, at a price, and considerable has been bought to tide over the emergency. Delivered prices have ranged from $90 to $102 a ton, with buyers frequently required to post cash in advance in New York.

Warehouse . . .

Warehouse Prices, Page 157

Pittsburgh — Most steel distributors are pessimistic over the supply outlook through first quarter next year, despite indicated well-sustained near-capacity output throughout the period. Chief cause for such concern is relatively large percentage of finished steel output scheduled for preferred industrial groups under the voluntary allocation programs. These programs are expected to adversely affect supply of plates, sheets and alloys more than other steel items. There has been little change in pattern of warehouse steel demand, with continued heavy pressure noted for flat-rolled steel items and more recently increased demand for merchant and cold-finished alloy bars.

Philadelphia — While warehouse

business this month probably will not equal that for October, when a new record for the year was made by at least one large distributor, jobbers anticipate an active demand.

Cincinnati — The jobber market is featured by the exceptionally strong demand for plates which are in acutely short supply. Mill shipments of steel enable a high level of sales, but there is no chance to build stocks which are chronically out of balance.

Los Angeles — Supplies for warehouses are being pinched off in two directions, and stocks are extremely short in flat-rolled products. Some jobbers ascribe this to the voluntary allocation program. Others have been seriously affected by the shipping tie-up, with an estimated 40,000 tons of warehouse consignments tied up in Los Angeles-San Pedro harbor.

Seattle—Wholesale jobbers report market conditions unchanged. Prices are firm and schedules generally are being observed. Demand continues strong for all items. Inventories are low, some items being entirely out of stock.

To Inspect Ore Deposits

New York—Benjamin F. Fairless, president, and John Munson, vice president in charge of raw materials, United States Steel Corp., left Nov. 5 for Rio de Janeiro, Brazil, to inspect ore deposits in South America, particularly in Brazil and Venezuela.

Promptly after V-J Day, U. S. Steel resumed its practice of seeking full information on all foreign deposits of iron ore which might be utilized in the future to supplement the dwindling ore supplies in the United States.

For some time, U. S. Steel has been conducting extensive exploratory drilling south of the Orinoco river in Venezuela.

Iron Ore . . .

Iron Ore Prices, Page 156

Cleveland—Lake shippers will bring down at least 82 million tons of iron ore from upper lake ports this year, based on shipments which have just been reported for the season to Nov. 1. The total was 75,277,911 tons, compared with 71,466,495 tons for the like period a year ago. Of this year's total, 74,233,428 tons were from United States ports, an increase of 4,336,722 tons over the like 1947 period, according to the Lake Superior Iron Ore Association.

Shipments for the week ended Nov. 1 totaled 2,058,273 tons compared with 1,975,857 tons for the like week a year ago. Details of the movements for the season to Nov. 1 are as follows:

	—Season to Nov. 1—	
	1948	1947
Escanaba	4,236,263	3,717,328
Marquette	3,643,661	4,272,288
Ashland	4,824,631	4,811,751
Superior	27,670,789	24,086,767
Duluth	17,060,469	17,546,259
Two Harbors	16,797,615	15,462,313
U. S. Ports	74,233,428	69,896,706
Michipicoten	444,382	386,168
Port Arthur	600,101	1,183,621
Canadian Ports	1,044,483	1,569,789
Total	75,277,911	71,466,495

Rails, Cars . . .

Track Material Prices, Page 155

New York—While freight car demand in the east continues to lag, at least one sizable list is expected to be issued in the near future. Meanwhile, there is uncertainty in trade circles as to whether or not present rate of allocations of steel to car builders will extend beyond Feb. 28, when Public Law 395 is scheduled to expire. In some quarters it has been reported recently that the existing rate will continue until at least the end of the first quarter, regardless of what happens to the allocation law.

Actually the car industry, with backlogs of more than 100,000 cars, has on an average sufficient business to carry it almost another ten months at the present rate of production. However, much of this car tonnage, it appears, is being concentrated in railroad shops and a few of the larger commercial shops, with a result that various builders are not in as comfortable position as indicated by the overall backlog figure of the industry as a whole. Certain shops, in fact, claim they have only enough business on hand to last them three or four months, at even a modest rate of production. At the moment there is particular pressure for gondolas, a year or so ago it was box cars with supply of the latter easier, but still short of requirements.

The Baltimore & Ohio has begun a program for re-building 677 gondola cars, with work being done at its shops at DuBois, Pa., and Willard and Chillicothe, O.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 156

Washington—Production of coke in the United States in September by coke-oven operators declined 104,185 net tons below the August output because of one less working day; but on a daily basis, increased to 211,684 tons, an all-time high, according to the Bureau of Mines. This record was made possible by the extremely high level of operations maintained by oven-coke producers, especially those connected with the iron and steel industry, or "furnace plants," which operated at 96.3 per cent of their productive capacity. Stocks of oven coke at producers' plants increased 163,829 tons during September and on Oct. 1 were equivalent to 6.7 days' production. Stocks of coking coal at coke ovens increased 678,693 tons during September and on Oct. 1 were sufficient for 40.1 days' supply at the September rate of consumption.

Philadelphia — Although shortage of oven coke continues pronounced, foundries are receiving a better quality of beehive coke and this, combined with the fact that they are learning to use a combination of the two grades of coke more effectively, is enabling them now to maintain casting production fairly well. At least the coke shortage is not the handicap it was a few weeks ago.

Canada . . .

Toronto, Ont.—July production of primary iron and steel shapes in Canada totaled 276,250 net tons as against 301,478 tons in June and 228,844 tons in July, 1947. July production included 265,755 tons of carbon and 10,505 tons of alloy steel shapes. In the above figures for July are included 72,435 tons of steel shapes shipped to producers' own plants or plants within the industry for further processing.

In July, shipments of primary iron and steel shapes for sale totaled 206,243 net tons and included 197,066 tons of carbon and 9177 tons of alloy steel shapes; shipments for sale in June amounted to 220,351 tons, of which 206,873 tons were carbon and 13,487 tons alloy steel shapes and for July, 1947, shipments totaled 167,498 tons, of which 159,285 tons were carbon and 8213 tons alloy steel shapes. The above totals which show iron and steel shapes for sale do not include deliveries for further processing.

July shipments included 7764 tons of semifinished shapes, 13,197 tons of structurals, 19,321 tons of plates, 32,845 tons of rails, 9619 tons of tie plates and track material, 38,814 tons of hot-rolled bars, 8709 tons of pipes and tubes, 21,158 tons of wire rods, 21,170 tons of black sheets, 9237 tons of galvanized sheets, 6502 tons of castings, 3053 tons of miscellaneous hot-rolled products and 14,854 tons of all other products.

Of the amount shipped for sale during July, 52,174 tons went directly to railways and railway car shops; 9817 tons went to pressing, forming and stamping plants; 26,797 tons to merchant trade products; 23,822 tons to building construction; 15,956 tons to the containers industry; 8098 tons to agricultural equipment; 8803 tons to the automotive industry; 10,053 tons to machinery plants; 4235 tons to shipbuilding; 5485 tons to mining, lumbering, etc., and 1836 tons to miscellaneous industries. Wholesalers and warehousing accounted for 21,921 tons and exports for 17,246 tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1600 tons, three Woolworth stores, through Turner Construction Co., Philadelphia, to Bethlehem Steel Co.

550 tons, pumping plant, Columbia Basin project, to American Bridge Co., Gary, Ind., low $136,682.

475 tons, addition, Schmidt brewery, Philadelphia, to Morris Wheeler & Co., that city.

385 tons, powerhouse, Fitchburgh Gas & Electric Co., Fitchburgh, Mass., to Haarmann Structural Steel Co., Holyoke, Mass.; Stone & Webster Engineering Corp., Boston, contractor-engineer.

200 tons, Du Pont plant building, Carneys Point, Pa., to Ingalls Iron Works, Birmingham.

175 tons, addition, state hospital, Danville, Pa., to Reading Steel Products Co., Reading, Pa.

170 tons, state bridge work, Lackawanna county, Pennsylvania, to Pine Brook Iron Works, Scranton, Pa.

STRUCTURAL STEEL PENDING

1000 tons, state office building, Hartford, Conn.; bids in; second alternate covers building taking 500 tons.

400 tons, transmission towers for Seattle light department; bids in.

805 tons, state bridge and approaches, Wood-

bridge, Pa.; Brann & Stuart, Philadelphia, low on general contract.

225 tons, Washington state bridge, King county; general contract to Pacific Northern Construction Co., Bremerton, low $162,975.

210 tons, high tensile I-beams, Navy, Bureau of Supplies and Accounts, inv. 7055, east and west yards; bids Nov. 12.

150 tons, warehouse, Mauch-Hill Corp., Philadelphia; bids being asked through Turner Construction Co., that city.

Unstated, steel approaches and rebuilding Manette Washington state bridge; bids to Olympia, about Nov. 19.

Unstated, book stacks and improvements, Seattle Public Library; Remington-Rand Co., low $109,987.

Unstated, miscellaneous steel for Coulee power plant; bids to Bureau of Reclamation, Denver, Nov. 18.

REINFORCING BARS . . .

REINFORCING BARS PLACED

100 tons, Salmon Creek, Public Works Administration bridge, and miscellaneous jobs, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

5000 tons (estimated) lining main canal, Columbia Basin project; general contract awarded Western Contracting Corp., Sioux City, Iowa, low $1,933,391.

1800 tons, approach piers and anchorage blocks, contract 3, Delaware memorial bridge, near Wilmington, Del.; State Bridge Commission opens bids Nov. 30.

100 tons, Gorge diversion dam, Seattle's Skagit project; Cascade Contractors Inc. and A. V. Phillips, Seattle, low joint bid $967,553.

Unstated, addition to Seattle Public library; general contract to S. S. Mullen Inc., Seattle, low $338,800.

PLATES . . .

PLATES PENDING

3000 tons or more, 8100-foot, 22.3-foot diameter, Soap Lake siphon, Columbia Basin project; bids opened at Coulee dam, Nov. 4.

225 tons, Corps of Engineers, Memphis district; bids Nov. 15 inv. 72; also 110 tons hot-rolled sheets.

Unstated tonnage, three steel grader barges, Corps of Engineers, Memphis district, inv. 47; bids Dec. 7.

PIPE . . .

CAST IRON PIPE PLACED

1000 tons, various sizes, domestic water and irrigation systems, Yakima, Wash., to H. G. Purcell, Seattle, low $102,943 for domestic, and $13,397, for irrigation, for U. S. Pipe & Foundry Co., Burlington, N. J.

RAILS, CARS . . .

RAILROAD CARS PENDING

Great Northern, 66 passenger cars, pending; list includes 30 sleeping cars, 6 coaches, 6 dining cars, 6 coffee shop cars, 6 observation cars, 6 baggage cars and 6 combination baggage and mail cars.

LOCOMOTIVES PLACED

Erie, 26 diesel-electric switch engines, including eighteen 1000-horsepower, four 750-horsepower and four 660-horsepower units; distributed among Baldwin Locomotive Works, Eddystone, Pa., American Locomotive Co., New York, Electro-Motive Division, General Motors Corp., La Grange, Ill., and Lima-Hamilton Corp., Lima, Pa.

LOCOMOTIVES PENDING

Pennsylvania, closes bids Nov. 12 on diesel-electric locomotives, contract 127-1948.

RAILS PENDING

New York Central, closes bids Nov. 15 on its 1949 rail requirements.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

OAKLAND—American Can Co., 3815 Eighth St., has awarded a $68,000 contr to Larsen & Larsen, 2455 Mason St., Francisco, for construction of a fact addition.

SAN FRANCISCO—Pacific Gas & Electric C 245 Market St., is building a $3,500, powerhouse northeast of Marysville, a million natural gas storage tank at R mond, and a $105,000 electric substation Sunnyvale.

FLORIDA

MIAMI, FLA.—E. P. Larsh, c/o contrac has awarded a $150,000 contract to Lyle Roberts, 4133 Ponce De Leon Blvd., Co Gables, for construction of a boat shop storage building.

INDIANA

CONNERSVILLE, IND. — Roots-Connersv Blower Corp. is constructing an extens to its No. 1 shop for test floor and shipp space at an expenditure of $135,000.

MICHIGAN

DETROIT—Central Iron Foundry, 240 Orle St., has awarded a $125,000 contract Douglas-Cloud Co., 725 Penobscot Bldg., a core room extension.

DETROIT—Detroit Steel Products, 2250 Grand Blvd., has awarded a contract O. W. Burke Co., 1032 Fisher Bldg., fo manufacturing building addition.

MINNESOTA

MINNEAPOLIS — University of Minneso R. S. Callaway, purchasing agent, 323 A ministration Bldg., is planning to build $160,000 boiler unit at campus heat plant; Helmick, Edeskuty & Lutz, 412 Es Bldg., engineers.

MISSISSIPPI

MERIDIAN, MISS.—General Box Co., McNair & Archer, architects, Rosenba Bldg., is planning to build a $600,000 ma facturing plant.

MISSOURI

ST. LOUIS—Schlueter Mfg. Co., 4616 Broadway, plans to build a manufactur plant east of Grand Ave. at Robert Ave. cost $200,000 including equipment; B. Peters, architect.

NEW JERSEY

UNION, N. J.—Purolator Products Inc., Broad St., Newark, has awarded a million contract to Walter Kidde Constr tors Inc., 140 Cedar St., New York, design and construction of an oil fi manufacturing plant at Liberty Ave. Spruce St.

NORTH CAROLINA

WINSTON-SALEM, N. C.—R. J. Reyno Tobacco Co. is building a $100,000 pov plant addition on Patterson Ave.; J. E. S rine Co., Greenville, S. C., architect.

OHIO

CLEVELAND—S. & Z. Machine Tool & Co., 3180 Berea Rd., maker of metal stan ings, plans to start construction of a $15,0 factory addition.

CLEVELAND—Dass Machine Co., Marvin Green, Chesterland, O., president, has b incorporated to operate a machine shop 2717 E. 75 St. to manufacture mainly craft parts.

CLEVELAND—Cleveland Cap Screw Co., 2

E. 79 St., has awarded a $200,000 contract to Dean W. Rankin, 1836 Euclid Ave., for construction of a factory addition, boiler house, and wire storage building.

CLEVELAND—G. & S. Steel Sales Corp., David S. Stein, attorney, has been formed to deal in steel and steel products and expects to establish a warehouse and office here.

CLEVELAND—Jack & Heintz Precision Industries Inc. has completed arrangements with WAA to purchase machinery and equipment having an original value of $5 million and might buy two buildings at the Bedford plants, and sell the Berea plant.

CLEVELAND—Auto Bolt & Nut Co. has been incorporated through Roscoe M. Ewing, attorney, 1238 Guardian Bldg. to manufacture and deal in bolts, nuts, washers and other kinds of fasteners and to manufacture machinery and equipment.

HUBBARD, O.—Newsprint Corp. of America, c/o contractor, has awarded a $500,000 contract to American Industrial Co., 68 Main St., Buffalo, for erection of a paper mill to make newsprint.

KENT, O.—Lamson & Sessions Co., Mogadore Rd., Roy H. Smith, president, has completed a $150,000 addition to house the cold forge department and will install new machinery.

LISBON, O.—Hood Chemical Co., plans to rebuild its chemical manufacturing plant that was damaged in a $400,000 fire last June. They engaged chiefly in bottling and dry packaging and the manufacture of a household bleach.

STEUBENVILLE, O.—Jefferson Steel Products Co. has been incorporated by John Herndon, Parkdale Addition; Lawrence Howell, 1533 Ridge Ave.; and Frances A. Babicz, 701 Woodlawn Rd.; Joseph Stern, attorney, 102 N. Third St., is agent.

WILLARD, O.—Baltimore & Ohio Railroad, due to a heavy demand for gondola cars, is rebuilding 677 cars here and also at B. & O. shop offices in DuBois, Pa., Glenwood, Pa., and Chillicothe, O.

YOUNGSTOWN—Youngstown Hide & Tallow Co., Poland Ave., is erecting a $200,000 rendering plant on East Poland Ave. Rendering equipment will be installed when completed.

OREGON

LA GRANDE, OREG.—California Packing Co. has awarded a $250,000 contract to McCormick Construction Co., Pendleton, for construction of a warehouse and food processing plant.

PENNSYLVANIA

EASTON, PA.—General Aniline & Film Corp., Graselli, N. J., has awarded a $150,000 contract to E. C. Machin Co. Inc., 1024 N. Quebec St., Allentown, for two laboratory buildings; J. Baxter, chief engineer.

MARCUS HOOK, PA.—General Chemical Co., 1100 Line St., Camden, N. J., is planning to build a $100,000 industrial building; Edwards & Green, Broadway and Carmen Sts., Camden, N. J., architects.

MEADVILLE, PA.—American Brake Shoe Co. has completed its new foundry which will replace two plants at Pittsburgh, one at Meadville and one at Jersey City, N. J. The plant will make furnace parts, bronze steel mill bearings and castings, electrode holders, bronze structural castings and diesel engine bearings.

NEW CASTLE, PA.—Pittsburgh Piping & Equipment Co., 10—43 St., Pittsburgh, steel fabricators, has purchased the industrial building of Fisher Brothers located on Butler Rd. Operations will begin shortly after New Castle Pants Co., present occupants, move to its plant in Beaver Falls.

PHILADELPHIA—Modern Heat & Fuel Co., 4415 Chestnut St., has awarded a $350,000 contract to Leonard Shaffer Co., 926 Walnut St., for construction of a plant.

PITTSBURGH—Heyl & Patterson Inc., 35 Water St., has awarded a $600,000 contract to Trimble Co., 1719 Pennsylvania Ave., for construction of a machine shop and office on Pennsylvania Ave.

TEXAS

WASKOM, TEX. — Arkansas-Louisiana Gas Co., Slattery Bldg., Shreveport, La., plans a $400,000 gas plant expansion.

WASHINGTON

YAKIMA, WASH.—Rankin Equipment Co., 1010 S. First St., plans to build a $250,000 warehouse and display building.

WEST VIRGINIA

WEIRTON, W. VA.—Signode Steel Strapping Co., 2600 N. Western St., Chicago, has awarded an $80,000 contract to Weirton Construction Co., Pennsylvania Ave., for construction of a manufacturing building.

CANADA

TORONTO, ONT.—O'Keefe's Brewing Co., 297 Victoria St., has awarded a $150,000 contract to Evan S. Martin, 16 Saulter St., for erection of a cold storage plant.

WOODSTOCK, ONT.—J. Cullen & Sons Ltd., C. Kirk, secretary, has awarded a $100,000 contract to Carter Construction Co. Ltd., 419 Cherry St., Toronto, for construction of a mill on Wilson St.; C. D. Howe Co. Ltd., 36 James St., Hamilton, engineer.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Continued from Page 157*)

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.l. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.0c per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 5.75c per lb of briquet, c.l. packed 6.55c, ton lot 7.35c, less ton 8.25c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 5.90c, c.l. packed 6.70c, ton lots 7.50c, less ton 8.40c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 80.00c per pound of Mo contained, fob Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. Fob Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon (Ti 15-18%, C 6-8%). Contract, $160 per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21% C 3-4.5%). Contract, $175 per ton, fob Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5 max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 3.25-4% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, fob Bridgeville, Pa. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract. 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.75 per lb of contained Cb, less ton $2.80. Delivered. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%; Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload, packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 42-46%, Ca 5%, Ti 9%). C.l. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%). C.l. packed, 14.25c per lb. of alloy; ton lots 15.75c; less ton lots 17.00c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis, rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Sigio, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c. Effective Jan. 1, 1949, price will be $1.10, Langeloth.

Technical Molybdic-Oxide: Per lb, contained Mo, fob Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 80.00c.